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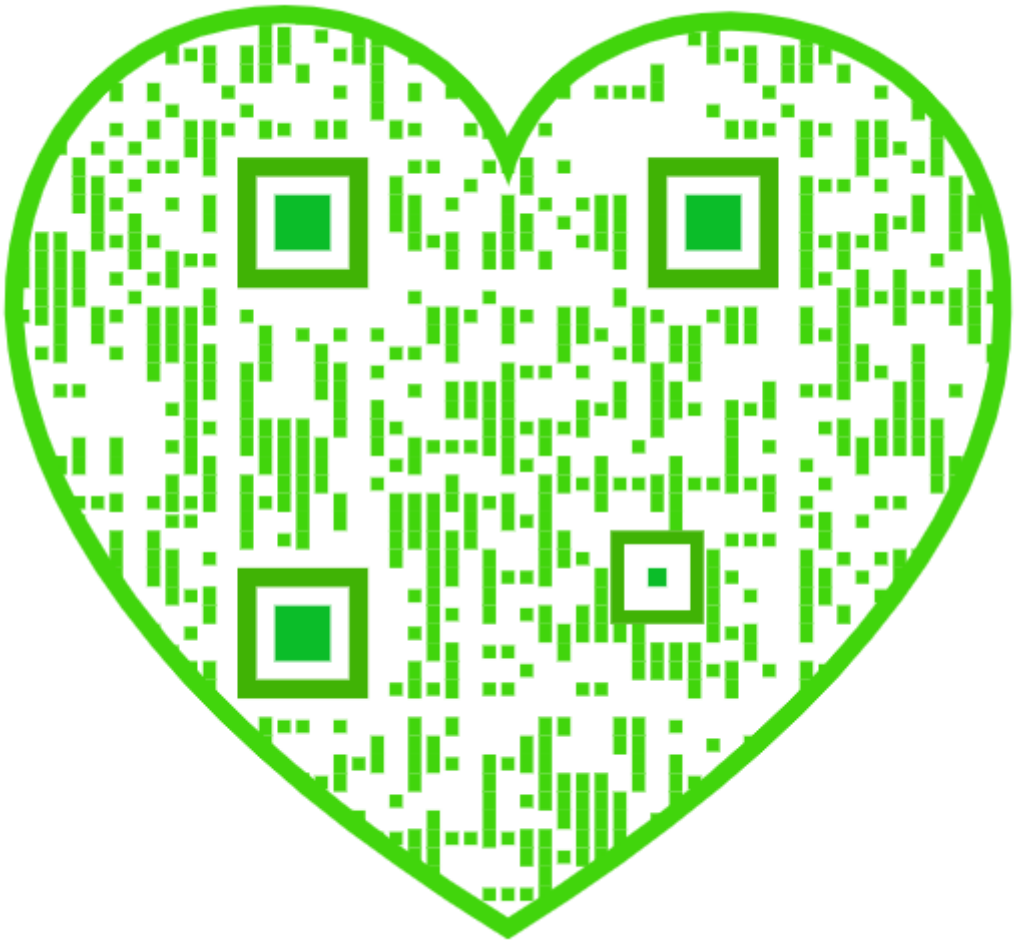
SWEET CORN

ALBERT E. WILKINSON



SWEET CORN

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PREFACE

A BOOK giving detailed information regarding the culture of sweet corn has been demanded by a large number of people. The author of this little book has tried to set forth the principles and practices in such a manner that the home gardener can obtain, in Part I, definite information. In Part II, the subject is handled from the commercial end, applicable to the market-growers in large cities and the shippers of sweet corn at more distant points. Part III is given over entirely to the raising of corn for canning and to the process of canning. It is hoped that those who study this little book will find much that is valuable.

The author has obtained much of the matter contained in this book from his own practical experience. However, he has drawn upon other sources for information, each source being credited for the material taken.

ALBERT E. WILKINSON.

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CHAPTER I
BOTANY OF SWEET CORN

SWEET corn, botanically, is one of the family *Gramineæ* of the tribe *Maydeæ*. It can be quite easily separated, owing to its definite characteristics, from the other groups which are included under the monotypic genus called *Zea*, the one recognized species being *Zea mays*.

Sweet corn is a plant which grows similar to the field corns, having an upright stalk with long, narrow leaves which have veins running the length of the leaf, and having the sexes of the flowers on two different parts of the stalk—the tassel, which is found on the apex of the stalk, and is known as the staminate part of the flower; and the so-called ears, which contain the pistillate flowers on a hard, thickened cob, all of which is inclosed in a husk.

From this cob and up through the end of the husk protrude fine, silky bodies, which

have some definite relation to each kernel of the cob. This is the so-called silk, and is known as the style. The style is single, and filiform, and leads into an ovary which is usually sessile. The ears are of variable size, shape, and color. The kernels of sweet corn on being dried are characterized by being transparent or semi-transparent. They are more or less wrinkled or shriveled, sometimes spoken of as being crinkled. The seeds would be classified as hard or more or less horny.

The plant is a tender annual. It will, therefore, not withstand the early frosts of our northern states. However, some varieties have been developed which will stand a certain amount of cold, which may be considered an improvement over other varieties.

CHAPTER II

HISTORY OF SWEET CORN

ACCORDING to all reliable sources, sweet corn is of strictly American origin. The very early history of this garden species is obscure, although some historians claim it was quite well known in early times. The peculiar appearance and decidedly rich, sweet, edible quality would naturally cause anyone on first viewing it to recognize and record the same.

The earliest record of its appearance is said by some to have been obtained from the Six Nations, a body of Indians in America, in the year 1779. It was brought by Lieut. Richard Bagnoll during General Sullivan's expedition against these Indians. At that time, it had the common Indian name, papoon corn.

Another well-known statement which was sent out in the *New England Farmer* in 1882 claimed that Plymouth, Mass., was the first place in America where recorded

account of sweet corn was given. This record was taken in 1779, when, it was claimed, the early settlers around Plymouth, Mass., obtained seed from the Susquehanna Indians. Subsequently, this seed was planted and raised by the early settlers, and it is possible to find in this particular section sweet corn which is not obtainable by purchase on the market, sweet corn which differs from the average sweet corn, grown for sale.

Still another account in 1822 accredits the earliest introduction from Sullivan's expedition among the Indians of the Susquehanna River. Still another account gives credit for the first corn as being found by Sullivan's command when it journeyed into the Genesee country, New York, in 1779, the seed being brought from that region into Connecticut, where it was grown, and from there spread towards the South.

However, earlier records than these, and even a few later records, do not show that sweet corn was well known. In Virginia, in the year 1780, Jefferson made a series

of notes, but did not mention nor hint of the cultivation of sweet corn. Timothy Dwight, who traveled in New York and New England during and previous to the year 1817, and who was in Yale college in 1795, claimed that there was a sweet corn, known at that time by the name of shriveled corn, which was maize of the most delicious flavor if consumed in the milky stage, and differed greatly from the general field corn. He even claims that this shriveled corn could be produced by successive plantings for table use from mid-July until mid-November.

As far as is known, the first sweet corn that was ever mentioned for sale was in Thorburn's seed catalogue of the year 1825. Only one kind was named in this catalogue, the so-called sugar or sweet corn. This was the first time that Thorburn had ever spoken by name of sweet corn. His "Gardener's Calendar" of a few years previous did not mention this product at all. Neither Gardiner nor Hepburn in 1818, nor Fessenden's "New American Gardener"

in 1828, mentioned sweet corn. It must, therefore, be assumed that it was little known at that date.

However, in 1829, before the Massachusetts Horticultural Society, there were several ears of a new variety of corn exhibited. This corn was sent from Portland, Me., and presumably was produced there. A little later, in 1832, Bridgeman mentioned one variety. From this, Salisbury in 1848 spoke of three and Buist in 1851 and Bennett in 1853 of two kinds. In the year 1854, in the "Gardener's Textbook" by Schenck, three varieties were named. Burr, in 1863, gave a very elaborate description of nine varieties; and three years later, 1866, he described 12 sorts. In 1884, an article by E. L. Sturtevant described 35 varieties as distinct varieties of sweet corn, and 32 of these were figured. From this time on, the number of varieties has steadily increased, until it would be at the present day a question just how many varieties exist.

In foreign lands, sweet corn was not mentioned until about 1885. Neither Noisette,

in 1829, in his "Complete Manual of the Garden," mentioned sweet corn; nor Bonafous, in his published folio works in 1836. So, by this, it must have been at a later date when the sweet corn reached continental Europe.

In 1883, Vilmorin, the great French gardener and seedsman, names and describes seven varieties, all of which have American names.

PART I

CHAPTER III

THE HOME GARDEN

SWEET CORN FOR THE GARDEN

LOOK as far as one wishes among the home gardens throughout the northern part of America, and it would be practically impossible to come across a garden which does not contain sweet corn. About every American family demands in the planning for a home garden the inclusion of several varieties of this choice garden vegetable. In fact, they never consider the garden complete unless it contains this plant.

The general cultural methods are so easy, and there is so little for the amateur to learn in the growing of this plant, that it easily lends itself to the culture which is given. It is important, too, to plan in these gardens for a liberal supply of sweet corn which will begin quite early in the summer and continue till the frosts of winter kill the plant. This would include the planting of several varieties or the

frequent successive plantings of one early variety. Great satisfaction and health can be obtained by the amateur grower in the production of sweet corn.

LOCATION IN THE GARDEN

As a general rule, sweet corn is always planted at the back of the garden. The question would arise just which is the back of a garden. In a garden with the rows running east and west, the northern part of the garden is generally considered the back. In this garden, the corn being planted at the north, though growing tall, will not shade the lower growing vegetables, which can be planted towards the south; and therefore, the maximum amount of sunlight may be obtained by these lower growing vegetables.

If the garden rows run north and south, it is a question just which part of the garden is the back. If, again, the north is spoken of as the back of the garden, it would be possible to plant the corn towards the north, but the arrangement would not look very good. It would be undoubtedly better to arrange the sweet corn in the

center of the garden or towards one side, grading the vegetables by height from the smallest up to the corn.

The question would now arise, If a rotation of crops is practiced in the garden, just where should the corn be placed? If grown towards the north each year in a garden with the rows running east and west, it would be possible to interchange corn with pole beans, and perhaps with tomatoes if the tomatoes were staked, and therefore the soil would have a change of crops.

The soil requirements of corn are very general, and much of the corn is cosmopolitan as to soil. We find it growing on heavy clays and medium loams down to very light loams. However, as a general rule, the best corn is produced in a sandy or gravelly loam which has a liberal supply of manure incorporated in the soil. As the corn is naturally a shallow-rooted plant, it would require quite a storehouse of water near the surface for its best development. This would be obtained by having plenty of humus incorporated in the soil.

CHAPTER IV
MANURING AND PREPARING THE SOIL

MANURING

UNDOUBTEDLY the best fertilizer for sweet corn is of a natural sort, and as the crop is one that requires from 65 to 120 days to mature from seed, the manure should be of a lasting form. A mixture of horse manure and cow manure seems to be the one most advisable. However, horse manure or cow manure alone could be used to great advantage, the amount to an acre being 15 to 20 tons applied each year. More manure might aid greatly if it were available. On a small backyard lot 50 by 30 feet, one good wagonload would be enough.

This manure, if coarse or fresh, should be applied in the fall and spread over the garden and spaded in. If the manure is old and decayed, it could be spread on the garden in the springtime and at that time spaded into the soil. The general

policy in spreading manure is to spread it in a thin, even layer, breaking all lumps and thoroughly mixing it with the soil in the spading.

PREPARING

Spading. The home garden, as a general rule, is spaded rather than plowed. The

The home gardener out in the sweet corn patch 30 minutes before dinner.

tools, then, to use are the common garden spade or the spading fork. The general tendency in spading is to carry on the work somewhat similarly to plowing. Begin at one corner of the garden, say the southeast

corner, and spade in a straight line to the southwest corner, then from the southwest corner back to the southeast corner and so on until the garden is thoroughly spaded.

When placing the spade in the ground, do not have it perfectly straight. Have it slightly sloping so the point of the spade is a little in advance of the back. Remove the soil, allow it to drop off close to the position from which it was taken, and drop the spade on this soil so that the lumps are crushed somewhat. Be sure to leave a ditch or dead furrow between the portion of the soil which is unbroken and the broken soil.

The spading may be done, in the case of fresh manure, in the fall, leaving the garden rough at that time, and not preparing further until springtime. If the manure is older, the spading can be carried on in the early spring just previous to the time of planting the garden. Just before planting, the spaded surface should be thoroughly smooth.

PLOWING

On a larger home garden, the plow may take the place of the spade. The plowing should be carried on so that the furrows will run the long way of the garden, and the plowing should be as deep as possible. The manure should be plowed under at this time. It is important, however, that the furrows should not be laid over flat, but should rest one against the other, so that they are rough.

The garden may be plowed similarly to spading, going from one corner to the other and then back, if a reversible plow is used, or the garden may be plowed by throwing the furrows together in the middle and then working around these furrows. This last method is called back-furrowing. It is very seldom advisable to plow the garden and leave a dead furrow in the center of the plowed plot, as the dead furrow is a detriment to the growing crops.

Plowing can be carried on similarly to spading in the fall if fresh manure is used, or in the spring if old manure is used.

Sometimes a double application of manure is used, and then the newer manure may be plowed in the fall 6 to 7 inches deep, and in the springtime the older manure may be applied, followed by back-furrowing to the depth of 4 inches. This "fits" the garden very finely.

SMOOTHING OR RAKING

If the garden is spring plowed or harrowed and planting begins immediately, the smoothing can take place just previous to planting. The rake is a very good implement with which to do the smoothing. However, if the garden is large, a cutaway harrow should be used, first to break the coarser lumps, and then followed by a finer tooth harrow, such as the spike tooth or the spring tooth, and then with a Meeker or a hand rake.

On a small garden, the rake is the only tool necessary. The raking will break the coarser lumps, remove coarser particles, and leave the land level and fine. If back-furrowing is practiced in the springtime,

when a few rows of the back furrow have been made, the raking can commence, and all coarse material can be raked down into the dead furrow. This will leave the garden as the finest prepared bed, being level, and in fine shape. It is never advisable to rake too far in advance of the planting, as it fines the soil and causes the soil to pack down too hard in many cases.

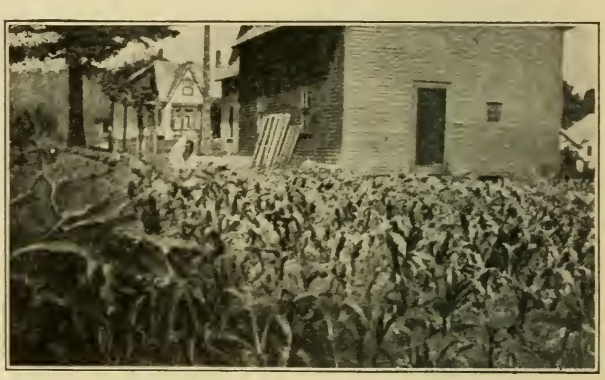
CHAPTER V
PLANTING
WHEN TO PLANT

CLIMATIC conditions are the important factor in deciding when corn shall be planted. In warmer sections of the Middle Atlantic states, corn can be planted much earlier than a little farther North; and in New England, near the water, the corn may be sown earlier than farther back and farther North. The general rule is, when all danger from frost is past, it is then time to plant corn.

In states where frost comes every month in the year, a certain amount of chance must be taken, and the corn must be planted nearly on a certain date. In the northern part of the United States, from May 1 to May 15 seem to be the dates used in the planting of sweet corn. A little farther south dates a little earlier than these are advisable. Seasons vary. If the weather conditions are quite favorable for corn planting in the latter

part of April, it would be advisable to risk some seed in order to gain early corn. If the season is backward and cold, it will not be advisable to place the seed in the ground even if it has been planted for 10 years on an average of May 10.

Not only climatic conditions must be considered, but soil conditions as well.



Sweet corn growing in the home garden.

If the soil is a clay and very wet, it is naturally a cool soil, and it is not advisable to plant corn early in this soil. In the case of sand which is very dry, it does not seem to be advisable to plant early corn there. As

a general rule, soil conditions have something to do with the depth the seed is to be planted. It is necessary on moist soils or heavy clay soils to plant the seed shallow; whereas on sandy soils and on drier soils it is necessary to plant the seed deeper.

The old gardener's rule which said "seed should be planted to the depth of twice the diameter" is one that will apply here, especially if common sense is added to this formula. Sometimes it is necessary to place the seed 1 inch deep on certain soils, and other times a half inch is as deep as would be reasonable for this seed. In very dry sand, even 2 inches would not hurt, as the seed must have certain conditions of moisture in order to start its first germination processes. The average depth, however, is about 1 inch.

HOW TO PLANT

There are two methods of planting sweet corn. One is by hand and another with machinery, which is driven by man power. Larger machines driven by horse power

could be used if the garden was large enough. However, the home garden is generally a small affair, and does not permit of the utilization of these larger machines.

With the hoe, the seed may be planted in the following manner : A line may be stretched across the garden, or a mark may be made in the soil where the row of corn is to be planted. If the seed is to be planted in hills 1 foot apart or 18 inches, the hoe may be used to excavate a small space, where from 6 to 14 seeds may be spread. These are then covered with soil, and the soil pressed over them with the hoe. If desired, the holes may be made first, the seeds dropped next, and the covering and pressing of the soil may be carried on in turn.

If a small hand planter is used, it may be inserted in the ground at the proper distance in the rows, and the machine worked to drop six or eight kernels of corn, or even more if the time of planting is very early. With man-power machines,

the row is marked out and the machine is set to plant in hills certain distances apart. The machines should be tested in order to know just how many kernels are dropped at these intervals before the work is carried on in the garden. One of these machines will drop in hills, 4, 6, 8, 12, 18, or 24 inches apart, and a marker can be arranged so that rows can be marked from 4 inches to 3 feet apart. These machines save a great deal in the man's time, and place the corn at practically a uniform depth.

If the plow is properly arranged, these machines not only open the furrow for the seed, but drop the seed, cover the seed, press the soil over the seed, all in one operation, as fast as a man walks.

NUMBER OF SEEDS TO PLANT

I have mentioned, in planting, that the seed varies from 6 to 14 in each hill. A reason for the larger number of seed is that the earlier one plants, the more risk in planting at this date, and therefore, the more chance for decay rather than growth;

and as it is necessary to have some plants grow in these spots, if possible, more seed is given, so that there are more chances for success. In the later seedings, less seed is used, as the risk is not so great.

After the seeds sprout and the seedlings come through the ground, they may be thinned to the required number in the hill, generally three or four good, vigorous plants being left. Where the greater amount of seed is given, there is more opportunity for better selection, as the greater number of plants produced offers chances for closer selection.

CHAPTER VI
INCIDENTAL CARE
CULTIVATING

THE tools necessary for cultivating in the home garden may consist of nothing more than the hoe, followed by the rake; or there may be a wheeled hoe, which is of the man-power type; or in, a very large garden, the one-horse cultivator type with from 5 to 12 teeth on the cultivator may be used.

In the question of the hoe and rake, it is possible to hoe around the hills of corn and between the rows, breaking up the surface soil after each rain, or if it does not rain, every week or 10 days, following the breaking up of the soil with raking, leaving the top soil perfectly loose and without any footmarks. This is perhaps the best method that can be adopted, and is quite adaptable to the small-sized home garden.

Where the garden is a little larger and the man-power wheeled hoe is used, the

wheeled hoe may be run between the rows and the hand hoe may be used around the hills in the row. This may be followed again by the wheeled hoe. However, the individual's steps are noted in the cultivated ground, and these are quite numerous if the operator is not familiar with the particular machine. Where the man takes long steps with the wheeled hoe, the marks are not so numerous, and therefore, cause but little injury.

As to horse tools, they may be used between the rows and the hand hoe among the hills. This will leave the soil in quite a loose condition. If the garden is of some size, it would be better to use a tool which would cultivate the whole surface until the corn has come through the ground, and then follow with the horse cultivator. Cultivation seems to be quite necessary for the best corn growth, as it conserves the moisture in the soil and keeps down the weeds. It is this competition between the plant and the weeds which causes the

greatest amount of trouble, and the loss of moisture from the soil which results.

There is one important point to remember in cultivation, and that is that the root system of corn is very shallow, and if deep cultivation is practiced, great injury is given to the roots. If deep cultivation is thought best to be practiced, begin it at first, and gradually decrease the deep cultivation near the plant until the whole surface is shallow cultivated.

SUCKERING

Suckering seems to be necessary in the growing of a great many of the varieties of sweet corn. Suckering is the removing of the shoots which start at the base of the corn which do not produce edible ears, nor anything else of benefit to the plant. These side shoots may be easily pulled from the plant by a quick motion and destroyed or thrown upon the compost pile. If they are taken from the corn, the resultant corn, as a rule, is greatly improved, as all of the food will go into the making of ears on the main

stalk, and not to furnish nourishment for the suckering growth. There are some varieties of corn that do not sucker so freely, and therefore little or no attention is necessary in their cases.

CHAPTER VII
INTERCROPPING

IN the home garden where space is at a premium, it seems necessary to use some other crop with corn, and therefore utilize the space to grow several crops on the same land in the same year. It is possible by two methods to grow a crop of corn and some other crop on the same land, either at the same time or in succession.

COMPANION CROPPING

With the first method, companion cropping, spinach and corn may be grown together. The spinach may be planted on the corn land in rows 1 foot apart, the seed of the spinach being planted very early in the spring and the land being given over to the growing of corn a little later. At the time the corn seed is placed in the ground, the spinach will be very nearly edible. However, it is all removed by the time the corn has grown to a height of 6 inches to a foot.

Corn and beans may be used together. Sometimes individuals use growing corn stalks for poles for pole beans, preferring this method to some other. However, beans may be grown in the rows of corn quite satisfactorily. The bean that matures more quickly than the ordinary corn is preferred. The crop is out of the way before the corn needs the entire space. The dwarf bean may be planted in hills with the corn, two or three seeds in each hill, or they may be planted in hills halfway between the hills of corn in the row. As soon as the first two or three pickings are given, the beans may be removed.

Radishes may be used amongst the corn as well, either planted at the same time as the corn or previous to the corn planting. Squash and pumpkins may be grown amongst the corn to great advantage. The seeds are generally planted in the hills of corn at distances apart to accommodate their growth. They cannot grow fast enough to injure the corn, and although they do hinder cultivation, together they

give two crops on the same land at the same time.

Sometimes it is possible to grow early cabbage between late corn, planting the cabbage halfway between the rows of corn and treating it as the crop. The cabbage is off the ground before the corn has reached the height of 1 foot, and therefore gives over the land for the growing of corn. There are many other combinations which could be used for companion cropping.

SUCCESSION CROPPING

An early variety of sweet corn and a late variety of celery can be used. The early corn may be of the transplanted sweet corn, or may be grown from an early variety of seeds. When mature, the corn is removed and the celery is placed in the rows between the corn rows. The same way, late cabbage may follow corn, also turnips, beans, spinach, lettuce, kohl-rabi, radishes, dandelion, kale, endive, late peas; or some of these crops or some others may be grown previous to the corn crop and

removed before the corn seed is planted. Each individual should work out the combinations which seem to suit best. It is by the use of these systems of growing crops that the greatest returns are obtained from the smallest acreage.

CHAPTER VIII
HARVESTING

THE question when to harvest is always a perplexing one to the amateur. Generally, the amateur has to break down the husk and actually see the kernels before he is sure that the corn is mature enough for harvesting. However, with a little experience, the amateur may merely grasp the corn in his hands, and if the corn feels firm and full underneath the husk, as a general rule it is mature enough. If this is not practiced, the thumb may be pressed against the husk, and if there is a "give" of the kernels, it is then known that the corn is fit for eating. These are the tests which will demonstrate whether the corn is in the milk or not.

In severing the ear from the stalk, it is necessary to grasp the stem of the ear just below the ear and grasp the butt of the ear in the other hand, bending the hands in opposite directions, the same as one would bend a piece of whalebone.

Nature has arranged for a ring or a section on the stalk where it will break quite easily, leaving a short stalk on the ear. The shorter the stalk, the better.

The corn is then generally placed in a basket, or more often in the crook of the arm. Where the housewife goes to gather the corn, generally the large kitchen apron is the receptacle used for the ears of corn.

The corn should be harvested just previous to placing on the stove for cooking. The shorter the time between harvesting and cooking, the better. The substance of one of the rules given by the author of a vegetable book is, the best corn for eating is harvested in less than 30 minutes from the time the butter is placed upon the kernels.

After the corn is taken from the stalks, and there are no more ears developing, it is best to remove the stalks from the garden and place them in the compost pile or throw them away. However, if the garden is attached to a farm, the best place for the corn stalks is in the cow's manger.

CHAPTER IX
VARIETIES

THE question of varieties is always a perplexing one, as varieties recommended by one individual are generally highly criticized by another individual under a different location or where the individual has used other varieties which he has found serve him best under his conditions.

As a general rule, there are some things to consider in selecting varieties. The first of these is the time each variety requires from seed to maturity. If a 60 to 65-day corn is required, then some other point must be sacrificed to obtain this earliness. If 110-day corn is required, then about every factor may be included in the selection, and the interval in the different time required between the early corn and the late corn may be filled in with other corn. However, in every selection some points may be gained and others sacrificed.

The height of the stalk is another important factor. Some of the early corns grow

only $2\frac{1}{2}$ to 3 feet in height, whereas later kinds develop on rich soil to the height of 10 or 12 feet, and produce ears at some distance from the ground. It is also found that not only is there a difference in the time of maturity and in the height of the

Extra early Adams corn. Not a sweet corn, but used as the extremely early edible corn.

stalk, but there is a difference in the number of rows of kernels on the corn, varying from 8 to 24, and not only in the number of rows of kernels on the cob, but

in the length of each ear. Taking these factors into consideration, each individual can select for his own purposes varieties of corn which will meet with his approval. However, as there is oftentimes an individual who has not the opportunity of selection from past experience, varieties will be recommended which might meet with some approval.

For very early corn, where quality and everything else except earliness are sacrificed, a corn which is not a sweet corn at all may be recommended—Extra Early Adams. Among the sweet corns, the Aristocrat is considered a good early one, Early Catawba is another, and Extra Early Cory and improved strains are very valuable for early edible corns, as well as First of All, Golden Bantam, Kendall's Giant, Metropolitan, Peep-o'-Day, and Premo.

For a later corn, generally classified as midseason corn, Concord (Bearsfoot), Black Mexican, Champion, Early Crosby, and Josiah Crosby. Several of the improved yellow corns, such as Goldenrod, Golden

Dawn, Honey Sweet are good; also white corn such as Howling Mob, Nonesuch, Perry's Hybrid; Potter's Excelsior, Premier, Quincy Market, Seymour's Sweet Orange and others are very desirable.

Early Crosby sweet corn. A second early sort of quality well adapted for canning, commercial or home garden.

For a later corn, Country Gentleman is very desirable. The Bearsfoot or Washington is good. Several types of Evergreen,

such as Livingston, Stowell's, White, Zigzag, and others are quite desirable.

The different characteristics of each of these will be given under sweet corn for commercial growing.

CHAPTER X

BREEDING AND SELECTING

FOR the home gardener, the breeding of sweet corn is generally out of the question. It is much better for the home gardener to depend upon reliable seedsmen for his sources of seed. However, it is possible to allow one or two of the earliest ears of sweet corn to mature and later to be removed from the plant, especially if the plant is one that produced two or more edible ears. These mature ears can be placed on the wall of a sheltered building, stripping the husks back, and hanging them up on a nail, being sure that plenty of ventilation is given and that the corn dries thoroughly without molding. This is practically the only advisable way for the amateur gardener to do.

If the ear contains some kernels which are discolored, such as yellow or black, or which have a glazed surface, it is best to throw these away and plant only the

crinkled kernels. These others are the results of crosses of the sweet corn with pollen from some of the neighbor's corn. There may be some value in these crosses, but they are generally questionable.

CHAPTER XI
INSECTS AND DISEASES

FEW if any insects and diseases trouble the home gardener, although one disease in particular sometimes troubles to a large extent. If a swelling on the stem forms which at first is white or grayish in color and later turns black and causes the stalk, perhaps, to bend over slightly, commonly known as corn smut, it should be removed and immediately destroyed by burning. This is perhaps the only disease that would cause any great amount of trouble.

There may be numerous insects, such as white grubs, which bother the corn roots in the ground. It is hard to control these, but they may be controlled somewhat by bisulphide of carbon injected into the soil, a small amount in each hill. For more detailed information concerning insects and diseases, refer to the commercial section.

PART II

CHAPTER XII

SWEET CORN GROWN COMMERCIALLY

SWEET corn is grown in the commercial garden under two general practices. The very early corn is grown by market gardeners, who are generally on high-priced land which is close to the market. It is only practicable for these gardeners to grow the earliest varieties and have the corn ready to place on the market when the price of corn is high.

The second class is that of the farmers farther back from market on cheaper land. These growers produce the later varieties and send the corn to market when there is a lessening price for the product. The later men are known as truck farmers. Sometimes the corn on these truck farms is grown in rotation with farm crops, and at other times it is grown in rotation with

vegetable crops. Less attention is generally given by these truck growers than is given by the market gardeners, and as a rule the returns from the acre are less than for the market gardens.

IMPORTANCE

According to the census for 1910, in the United States there are 48,514 farms reporting growing sweet corn. The number of acres devoted to this crop is 178,224, and the value of the sweet corn crop is $5,936,419. This is on farms which report one acre or over in the various states throughout the country. It is practically impossible to separate from these figures the number of acres on the farms and the value of the product produced by market gardeners and truck growers for commercial eating, other than canning. So this figure will have to be used as the importance of both.

The leading state in regard to number of farms reporting is New York, which is followed by other states, where the industry is of importance in the following order:

New York	6,584	Maryland	2,630
Pennsylvania	4,896	Michigan	2,433
Ohio	4,591	Illinois	2,431
Maine	3,542	Indiana	2,058
New Jersey	2,705	Iowa	2,013

As to number of acres, we find that New York leads with 23,739, but the states which follow next do not correspond to those having the greatest number of farms.

New York	23,739	Pennsylvania	11,764
Illinois	19,976	New Jersey	10,442
Maryland	18,387	Maine	8,693
Ohio	17,298	Indiana	7,977
Iowa	12,568	Michigan	5,726

In value of the product, New York again leads:

New York	$942,023	Maryland	$386,277
Illinois	558,746	Massachusetts	355,953
New Jersey	557,708	Maine	272,614
Ohio	526,162	Iowa	219,220
Pennsylvania	507,736	Indiana	188,054

The average number of acres per farm devoted to sweet corn in these various states is as follows:

Illinois	8	New Jersey	4
Maryland	7	New York	4
Iowa	6	Massachusetts	3
Indiana	4	Maine	2
Ohio	4	Pennsylvania	2
		Michigan	2

The value of the sweet corn on these farms is as follows:

Illinois	$229	Ohio	$115
New Jersey	206	Iowa	108
Massachusetts	185	Pennsylvania	103
Maryland	146	Indiana	91
New York	143	Maine	76
Michigan	$60		

The value per acre is:

Massachusetts	$74	Ohio	$30
New Jersey	53	Illinois	27
Pennsylvania	43	Michigan	25
New York	39	Indiana	23
Maine	31	Maryland	21
Iowa	$17		

CHAPTER XIII
SITE FOR SWEET CORN

AS a general rule, the slope of the land has a great deal to do with the proper selection of a location for the planting of sweet corn. If a very early product is desired, it is highly essential that a southern slope or exposure be given for the growing of this crop. If a later crop is desired, the slope is not so important. However, as corn is a warm-weather crop, a southern exposure for the later maturing crop may help. The farther north one goes and the shorter the season, the more important is the question of exposure or site for corn planting.

In the market gardens, as a general rule, the location for sweet corn is on a piece of land which has the maximum amount of sunlight, and, if possible, this would be a piece of level land or a piece of land which has a southern slope. The soil selected is generally a sandy or gravelly loam for the earlier varieties. The reason

for this is that a sandy or gravelly loam with a southern exposure means earliness, so the crop will be forced along owing to the fact that the land will warm up earlier and the growth of the seedling will be pushed along under these conditions.

If one has a clay soil, what can be done to improve this soil for corn growing? Applications of coarse manure are very advisable on this class of soil. Or, if such crops as rye, buckwheat, rape, and other non-leguminous crops can be grown, they are very advisable. Leguminous crops, such as clovers, vetches, cowpeas, and soy beans, will be very advisable if it is possible to grow them. These crops can be plowed under and incorporated with the soil, thereby improving the physical condition of the soil by making the clay soil more porous, etc.

If a gravelly soil or a sandy soil is available, it would be much to the advantage of the soil if large quantities of manure, either green crops plowed under or stable manure, could be used. It would increase

the water-holding capacity of the soil and increase the quickening of the crop to a considerable extent. It is generally highly advisable to use these things.

MANURING

As a general rule, stable manure is used for the growing of sweet corn. Horse manure is sometimes used on the more intensive gardens, but on most farms cow manure is used. The cow manure is found to be more lasting. Sometimes a mixture of horse and cow manure is used. Generally the manure is broadcasted—that is, thoroughly spread over the field—and all lumps fined, 15 to 20 tons being used in the truck sections, and as high as 40 tons or more being used in the more intensive gardens.

The manure is generally applied just previous to plowing in the spring; for, as a general rule, the manure is hauled out at this time. However, there are no reasons why the manure should not be applied in the fall and plowed under, or even left on

top of the coarser ground. If manure is not available, then cover cropping or green manuring may be practiced, similar to the method mentioned under the improvement of the soil.

Hen manure may be used at times, especially on a piece of land which has produced a crop of green manure which has been plowed under. The hen manure may be spread around the hills, or it may be placed under each hill of corn. The hen manure gives up its nitrogen quickly, and aids the plant by so doing. Sometimes an after-coating of hen manure broadcast would aid greatly in the development of the corn.

FERTILIZERS

Many formulas of fertilizers are advanced for growing corn, the general recommendations, however, being that a fertilizer which contains 2% nitrogen, 7% phosphoric acid, and 6% potash would be liberal enough, especialy if from 750 to 1,000 pounds was applied to the acre. The fertilizer is

generally used where no manure has been applied. Where manure has been broadcasted, it may be advisable to use 250 to 300 pounds of this mixture to the acre in the rows when the corn is planted, to hasten the development of the corn.

The fertilizer can be purchased in the above formulas from reliable dealers, but a great many times it can be more cheaply home mixed, the ingredients being purchased and the formula being worked up. In this case, it is often possible to buy only 1,200 pounds of the materials, and by the use of 800 pounds of filler have a fertilizer that will analyze 2-7-6, resulting thereby in a great cash saving on freight charges.

The elements in the fertilizer act as follows: Nitrogen aids in larger leaf development, and gives a thrifty green color to the plant. The phosphorus aids in the development of the seed to a considerable extent, and also in the development of the plant throughout. The potash aids somewhat in the development of the seed, but

more in the general development of the plant. These are the three elements that are required more than any others. However, about every soil has other elements which the plant needs, such as iron and so on.

It would be highly important, in purchasing a fertilizer, not to purchase one which was not to a great extent available to the corn in that year. It would be much better to buy a fertilizer with a high blood tankage base than it would with a low bone or leather base, as the blood tankage would be more available in the season.

PLOWING

The general question of plowing is usually one that the average individual does not consider of great importance. It is, however, of the utmost importance that thorough plowing should be given. If the plow used is one that will turn the furrow in such a way that it is partly inverted and is partly broken, as well as thrown over, still laying the soil over in a neat fashion, it is one to be desired.

Plows that invert the soil completely or do not break the soil up are to be avoided. Plowing may be carried on either in the fall or the spring, according to the available time of the farmer. Fall plowing, as a

Thick, heavy, broad foliage, denoting correct cultural conditions.

general rule, has the advantage of decreasing the amount of work in the springtime when the press of work is generally heavy. It also offers an opportunity for the breaking down of soil material, therefore causing earlier availability.

Spring plowing allows the farmer an opportunity to grow a cover crop during the winter and plow some green material

into the land during the spring. It is also considered best by a good many planters to have the plowing done only a short period before planting, as the soil then is in better condition for the quicker development of the seed.

The general plowing may be either back and forth across the field where a sulky or reversible plow is used; it may be around the piece, or it may be of the back-furrow method which is spoken of under the sweet corn growing for the home.

All of these systems have advantages with different individuals. The author prefers the method which does not leave a dead furrow in the middle of the piece, especially where the dead furrow is two furrows wide. Therefore, he inclines strictly towards the use of hillside or reversible plow rather than to the middle-of-the-field-dead-furrow method. If very intensive culture is desired, then both fall and spring plowing can be used, and the fall plowing may be 7 to 9 inches deep and the spring plowing only 4 inches deep.

This method was spoken of under planting for the home, and it may not be necessary to discuss it again here.

HARROWING

Following the plowing harrowing should take place if the plowing is in the springtime. If in the fall, harrowing is not necessary until just previous to planting. The tools needed in harrowing are of the disk type, either a plain or cutaway disk. This tool should be run first with the furrows, lapping half the width of the machine each time. It should then be used across the furrows, lapping half the width of the machine. If the soil is particularly hard, it may be to the advantage of the farmer to use the disk diagonally in either one or two ways.

Following the use of this tool, a smoother should be used, such as the spike tooth or the spring tooth. These tools will have a tendency to level the land and to fine the particles. If the plowing is carried on in the spring and the ground plowed is a heavy sod or has a heavy crop of green

manure, it might be advisable to use the roller between the plowing and the harrowing. It will firm the soil and help to unite the capillary tubes so that water may rise through the soil without being hindered.

The harrowing should not precede planting so long that uninterrupted weed growth takes place. In fact, the best method is to harrow just previous to planting. If the above methods of plowing and harrowing are carried out, it is found that the soil will be prepared thoroughly.

The advantages of good preparation are many with corn. Corn is a shallow-rooted plant, and requires its food quite near the surface. If the soil is thoroughly prepared near the surface, the corn roots have a larger feeding space and the plant food is more available. They have more water, more air, and therefore their growth is more rapid. There are other advantages from thorough preparation, and from all these it is firmly established that the resultant crop pays if thorough preparation is practiced.

CHAPTER XIV

PLANTING COMMERCIAL SWEET CORN

MARKING

ON many farms, a two-horse, two-row disk marker is used to mark the rows for the corn. This is a decided advantage, especially if the corn is to be planted by hand. Not only will the disk mark in one direction, but it may be used to cross mark as well, and at the intersections of the crosses will be found the places to plant the corn seed. Other markers could be used, such as a four-row marker made of a scantling with iron piping or post inserted through the scantling, and shafts arranged for the horse or one or two men to draw the same. The marking should take place as soon as the harrowing and fining are finished. In the case where planting is to be carried on with a corn planter, it does not seem to be necessary to mark the rows, with the exception, possibly, of the first row.

PLANTING

"Sweet corn requires more attention than field corn, both as regards earliness and the proper development of each plant." This reason causes seed to be planted in quick soils and in hills rather than in long drills.

There are two methods used by commercial growers of sweet corn in planting their corn. The first method is by hand, which is generally used by the market gardeners. The reason is that they wish to place their corn in quite straight rows where the least attention as to hand culture needs be given; and another reason is that they are under an intensive method, and oftentimes the whole thing can be put in quicker by hand than by machinery, as they have a large amount of labor available.

If a marker is used, and check-row marking is given, at the intersection of the mark, the operator could remove a small amount of the earth with a hoe and place there from six to eight seeds or even more if the season was not far advanced. The

seed is then covered and the soil pressed over this seed, and the next hill is planted, and so on. As a general rule, the soil is not deeper than 1 inch over this seed, and the softer the soil, the harder the pressure on the soil. The firming of the soil over the seed is given because the seed must come in contact with the soil, in order to absorb water from the soil, subsequently causing it to swell and start the development of the embryo.

The hand method has a great many advantages. Many times the rows are a great deal straighter than by any other method. The correct number of seeds is practically assured in each hill, therefore insuring a more even stand. The seed is put at quite an even depth, and the soil is firmed correctly over the seed.

The second method is by machinery. There are several kinds of machines, such as the one-row planters, and the two-row, two-horse corn planters. Then, there are smaller machines which have wheeled attachments, one or two wheels, and have

a plow arrangement and a place to drop the seed, cover the seed, press the seed, and mark the next row. These may be planters equipped with a long rod for marking the rows from 2 to 3 feet apart.

A one-row horse planter is generally a

Sweet corn used as a companion crop with young fruit trees.

difficult machine to operate and keep the rows absolutely straight. However, some men have been able to accomplish this feat. The two-row planter is much easier to operate and keep the rows straight, and it is possible with the machine to place

the corn so it is in check rows. This is quite an advantage, and as it requires only one man to operate, there may be some saving in the labor. These horse machines would be quite advisable on the truck grower's farm, less so on the market gardener's.

The man-power, wheeled machine would be more advisable in the market gardener's hands, and less so in the case of the truck grower's. The number of seed dropped with these machines varies from 2 to 10 or 12, and as spoken of before, it varies with the machines. It also varies with the size of seed used. If the seed is of uniform size and the machine is run correctly, practically four or five seed are dropped each time.

Each one of these machines opens the furrow, drops the seed, covers the seed, and several firm the soil over the seed. The one-horse planter has the added advantage of dropping fertilizer just previous to dropping the seed. This may help in starting the seed off earlier in the spring. One peck of seed is required to plant an acre.

CHAPTER XV
TRANSPLANTING
METHOD OF PROCEDURE

GENERALLY speaking, corn is one of the vegetables that is not transplanted to any great extent. However, there are some men in the country that have found it greatly to their advantage to grow sweet corn under forced conditions and later transplant it to the open grounds. A notable instance of this is William Sim of Essex County, Mass., who grows enough sweet corn in earthern pots to plant 15 acres. Generally speaking, sweet corn is started in the greenhouse or in the hotbeds, later being shifted to the cold frames, where it is properly hardened, and from there it is placed in the field.

The receptacles used for growing sweet corn vary. Strawberry boxes, such as the quart type, may be used, about five kernels being placed in each box; and when these receptacles are placed in the field, the bands are cut and the box is removed from the

soil. The principal objection to these quart boxes is that they are not firm, and have a tendency to break some of the roots.

Lately there has been employed another strawberry box, known as the pint, which has solid sides and is much stiffer than the quart type. About four seeds are placed in these boxes at first, later thinning to but three plants in each box. The plants and earth are removed from the box by slitting down one edge, the plants then being properly placed in the ground.

Paper bands and paper pots are often employed. In the case of the bands, the corn roots have a tendency to grow through the bottom of the receptacle, owing to the fact that there is close connection between the dirt inside the band and outside and nothing to interfere; they have proved not quite so satisfactory as other forms. With the paper pots, when the corn is transplanted the base of the paper pot is removed and the upper parts slipped up, the plants then being immediately placed in the ground. About the same number of seeds

are used in these paper pots and bands as are used in strawberry boxes.

Once in a while, on a smaller place, tin cans or other receptacles of like nature are used to force the corn. These are not as good as those previously mentioned. Occasionally, inverted sod is used, in which four to six seeds of corn are planted. The last method has been found quite satisfactory, owing to the fact that the roots of the sweet corn entwine themselves among the fiber of the sod and are held quite firmly. However, the sod has the objection of being somewhat disturbed in transplanting, and it often causes breaking of the corn roots.

One of the best receptacles for use in growing corn for transplanting purposes are clay pots, the sizes varying from 4 to 6 inches, the larger size being preferred. They permit of growing the corn a little larger, and allowing ample room for fuller development of the roots. The principal drawback with the use of clay pots is the expense in purchasing these pots. As they

last for several years with reasonable care, they are cheaper in the long run.

In the use of these transplanting devices, it is practically understood that a good soil, either a composted soil or a rich garden soil, be used for the proper forcing; that careful attention to the watering of the sweet corn and to the ventilation be given. As a general rule, sweet corn, being a hot-weather plant, requires a hotter temperature than such plants as cabbage. Sweet corn grown with eggplants will do much better than with the cooler crops, such as cabbage, lettuce, and cauliflower.

In starting the plants, other than the receptacles to hold the dirt and seeds, no tools are necessary. However, if soil has to be sifted, of course a screen and shovel would be needed. When the time of transplanting arrives, it is found necessary to convey the plants to the field in some manner. The best method seems to be to place them in large flats or boxes, the boxes being not larger than one man can handle comfortably. These boxes are distributed

over the field. The men following open the holes where it is found that the plants are to stand, and place the transplanted plants in the holes, pressing the soil about their roots quite carefully. It is better with the method of transplanting to mark off the field previous to transplanting, thus insuring straight rows and equal distances between plants in the row.

With a transplanted plant, such as spoken of, it does not seem necessary to water them when they are placed in the ground if due care is given in the transplanting. However, if they are handled roughly or the soil is quite dry, it would be greatly to the advantage of the continued growth of the plant to have water applied to the soil when the plants are set.

The date for planting outside is as soon as possible after the weather becomes settled or all danger from frost has passed. The time, in most sections of the North, may be from May 15 to May 20; and the farther south a person goes, the earlier the season. It is important, however, to place the

potted plants in the field at as early a date as possible, in order that the development of the stalk may continue, so that corn may be produced early, assuring a high price.

The question might arise, When would it be practicable for the ordinary grower to use the method of transplanting? For a truck farmer who is a considerable distance from his market, it seems to me that it would never be practicable for him to transplant corn on a commercial basis. For a market gardener who is close to a high-priced market, it seems very practicable, from all results obtainable, for him to practice the method of transplanting sweet corn.

Where the price received is 25 cents or more for a dozen ears of corn in fairly large lots, it undoubtedly pays well. The advantages of this system of planting are that one is able to receive the highest price in the market for the product, and by planting the corn so early, one is able to utilize the land for a larger money crop following the corn crop. The disadvantages are that it is a rather expensive method and requires much labor.

CHAPTER XVI
INCIDENTAL CARE AND MANAGEMENT

CULTIVATION

THE cultivation of sweet corn does not differ greatly from the cultivation of any other corn, if the other corn is grown under an intense method. As a general rule, sweet corn requires more attention than the ordinary field corn, because of the fact that the corn must have continued growth for its greatest success, and also from the fact that the sweet corn is a more tender plant than the hardier field types.

The tools necessary for proper cultivation are, first, a weeder which can be drawn by one horse and used from the time the seed is planted until the plants are about 3 to 4 inches high. With some men this tool can be used longer. With other men it would be necessary to stop the use of the tool at the time mentioned.

The general methods employed are to use the tool across the marks where the

planter has placed the corn, follow this by going with the rows, and so on, alternating before the plants have come through the ground. After the plants are above ground, the cultivation must be with the rows, in order to stop injury. In the place of a weeder, with some men, it is possible to use a light, old-fashioned A-harrow, especially if the man is careful with his work. The great advantages of these tools are that they are widespreading and do not require the hoe to be used on the corn at first, as they cultivate the entire surface of the ground.

Following these weeders, an 11 or 12-tooth one-horse harrow or cultivator seems to be the best tool to use. It is questionable whether it is practicable to cultivate corn deeply at first. It has been my experience, just the same as other men that have been in the business, that shallow cultivation with a fine mulch on the surface at all times will give much better results than deep cultivation at first with shallower cultivation later. With the use of these

fine-tooth cultivators, it is possible to work quite close to the rows, thus reducing the amount of hand hoeing to the minimum.

It seems to be necessary to use the hand hoe about twice on sweet corn fields. However, there are some exceptional cases where the weeder has been used thoroughly, followed by thorough use of the fine-tooth cultivator, where hand weeding is practically done away with. This reduces the cost of cultivation greatly, and where it can be employed is strictly the best method. The time to use these tools, in the case of the weeder, has been quite thoroughly explained.

In the case of the harrow or cultivator, they should be used through the growing season at least twice a week at first for the best development of the corn. If rain is frequent, it would be practical to use these cultivators following a rain as soon as the soil is dry enough to permit of thorough cultivation without injury to its texture. Corn cannot be cultivated too often. Some persons claim that three times

is enough for their corn. As a general rule, these men do not harvest very large crops. Where a man cultivates ten or more times, the returns are measured somewhat by the number of cultivations.

The advantages of thorough cultivation are:

(1) Conservation of the moisture in the soil.

(2) Breaking up of the soil particles, allowing entrance of air to the roots.

(3) Fining the particles of soil, thereby making possible the solution of some of the elements contained in the soil.

(4) As a direct result of the former, making it possible for the soil to catch and hold more water.

(5) Killing weeds.

Perhaps a discussion of one point, that of conservation of soil moisture, would be of interest. For every pound of dry matter contained in the corn plant, it requires about 300 pounds or more of water to form this pound of dry matter. Another great factor in the conservation of moisture is that of

supplying enough moisture to dissolve the mineral elements in the soil and allow this moisture to serve as a conductor of these elements into the plant. Fertilizer would be of no value to the plant, or any form of plant food, unless the water was there to dissolve the elements and convey them into the plant.

It may be of some interest to growers of sweet corn to have a summary of the work of the Federal Department of Agriculture on the weed factor in the cultivation of corn. The subject of weed control is recognized as a fundamental one in tillage philosophy. It was therefore determined to carry on over a wide range of climatic and soil conditions a large number of tests of the relative yields of corn produced by supposedly optimum cultivation, as compared with mere weed elimination. The experiments were made by having two plats or sets of plats, one of which received no cultivation after planting, the weeds being kept down by a horizontal stroke of the hand hoe at the surface of the soil, particular

care being taken not to disturb the soil or destroy the soil mulch. The other set of plants received the usual cultivation.

This work has been carried on for nine years, beginning in 1906 in co-operation with several stations and with farmers, many of whom were graduates of agricultural colleges. The author carried on the experiment for two years in co-operation with the Government. The general average of these experiments shows that the weeded plats produced 95.1% as much fodder and 99.1% as much grain or corn as the cultivated ones. If there was any difference between either set of plats in regard to thoroughness in keeping down weeds, it was in favor of the cultivated plats.

Although it remains to be demonstrated how far this principle may be applied in any particular section, as a general average for all the regions in which this work was done, it may be concluded that the proposition just stated is substantially true. If this be accepted, weed control becomes the principal object of cultivation. Weeds may

be attacked in two ways: First, by the use of tillage implements, the primary purpose of which is their eradication; and, second, by adopting cropping systems having that object in view.

This summary of facts as obtained through these experiments is indeed startling to the average individual—that the most important factor in the growing of corn is the eradication of weeds, stopping the competition between weeds and the growing crop. However, as general advice, I think that the average farmer should still continue to cultivate. A system which has been carried on since the earliest introduction of cultivated plants by man seems to be too strong to combat by a nine-year test. In a few years more it may be demonstrated that what has been found in these nine years is not absolutely true.

SUCKERING

It seems to be necessary for the best development of sweet corn under intense commercial systems of culture to remove

all the side shoots, in order that the remaining corn may derive the full benefit from the growth of the plant. It has been found after many years of investigation that where suckering is carried on, the plant responds to this suckering in the production of more marketable ears of corn to the acre. It would then seem necessary, in order to have increased yields, to carry on the process.

The general tendency with most men when working through the corn field with the hand hoe, as they come to a hill of corn and find side shoots developing at the base of the corn, is to grasp these shoots firmly in the hand, and with a side jerk to separate them from the main stalk. This work is called suckering. Sometimes it is practical to use these suckered stalks by feeding them to farm animals. However, it entails some labor to collect the stalks and carry them away, and with the majority of farmers, they are allowed to lie on the ground and wither. Later, they are cultivated into the soil.

At the same time that suckering is carried on, two other phases of work may be accomplished as well. If the corn is far enough advanced so that the plants are easily shown which will produce ears and those which are barren, it may be well to pull out the barren stalks, as they are of very little value to the corn field, and particularly so if the individual allows some of his corn to mature for seed purposes. These corn stalks might have such an influence on the kernels of the corn that they would injure the future crops. Where a question of detasseling is concerned, it may be well to detassel the plants at the time of suckering. Detasseling is easily carried on at this time, because the work is generally of a nature that will give close association with each individual plant.

It has been found in growing a great number of varieties of sweet corn that certain varieties of corn sucker more freely than others. It may be of value to the market gardener or the truck grower if he would cultivate the varieties that do not

sucker quite as freely as others. This point can be easily ascertained by growing one or two varieties of corn on the land, and watching the habit of their growth; and if they are found to sucker freely, to do away with these varieties and plant only those which require less work in the handling.

CHAPTER XVII
HARVESTING, PACKING AND MARKETING

HARVESTING

AS a general rule, the market gardener or truck grower is so familiar with the maturing of sweet corn that it is not necessary to tear down the husk and look at the kernels to see whether the ear is in the correct stage for consumption or not. The general characteristic of the corn—the appearance of the silk and the plumpness of the ear—is the mark by which the grower is able fully to determine the maturity of the sweet corn. However, the majority of them use the method of grasping the ear, and when they find it to be plump under their grasp, they realize the corn is in the correct stage for harvesting.

The methods employed in breaking the ears from the stalk are similar to those mentioned under harvesting in the home garden. The corn can be removed by some growers, however, by a quick movement

with only one hand. When this is done, sometimes more stalk at the base of the ear of corn is removed, and a little later this part is broken off and thrown away. The general practice in harvesting is to distribute boxes or baskets throughout the field, and the corn is placed in these boxes as quickly as possible. Later, these boxes are placed on wagons and hauled into the packing shed. In some cases, especially on truck farms, it is found easier to hold the corn in the arms and immediately place the same in the body of the wagon.

GRADING AND PACKING

Grading is not practiced with sweet corn as thoroughly as it is with some other vegetables or with the fruits. However, it has been determined by some market gardeners and truck growers that conscientious grading will pay. In the system of grading, the ears of uniform size and shape are selected, and with the same color as to maturity of the husk. If the general run of husks are of a yellowish-green color,

DIRECT SALES—GROWER TO CONSUMER

Courtesy Cornell University.

slightly inclined towards green, all of the ears should be of the same color, and none with lighter husks should be placed with this grade.

Ears such as the Golden Bantam, Cory, and other very short ears, should never be placed with large-growing ears, such as Evergreen, but the two should be separated and graded accordingly. At the time of grading, if there is a portion of the stalk on the end of the ear which is too long, or if there seems to be too much husk around the ear, it would be greatly to the advantage of the grade to remove the excessive stalk and some of the husk as well, thus improving the appearance of the ears.

In packing the corn, one market uses a bushel box. In the box, the ears are placed with the butts of the first or bottom layer towards the outside of the box, the butts of the next layer towards the middle of the box, and with the next layer towards the outside, anywhere from five dozen ears in the case of the early and smaller varieties

of corn down to four dozen ears in the case of the larger corn being placed in a box.

Other growers pack their corn in bags. This is not a good receptacle for packing corn, as it does not set off the goods as well as the bushel box. It also has a tendency to cause the corn to heat more quickly, as it does not allow free circulation of air; and in these bags, where there are as many as 100 ears, the tendency to heat is very great.

Hampers and peach baskets are sometimes used for the shipping of corn, also barrels as well. The ears are generally put into the receptacle in an upright position, packed just as tightly as possible.

In some special market, it is possible to find small baskets, such as the common market basket, which will hold from three to four dozen ears, according to the size. These are quite attractive to the consumer.

In a specialized market, one can find corn packed by the dozen in paper boxes, and sold for a correspondingly high price.

The method is indeed a very choice way to sell corn, especially so if a tissue paper is used on the exterior of the corn. The paper will set off the corn and make it very attractive, spelling satisfaction with the consumer as far as sales are concerned.

PAPER BOX PACKAGES FOR VEGETABLES

(*From American Agriculturist*)

The scheme is perhaps best described by taking up the handling process step by step. The first task is to make ready the packages. These are not baskets, bags or crates, but paper cartons such as are used by bakers, laundrymen and manufacturers. They are dark green in color and come from the factory in the flat, cut and ready to fold together. Each one is just large enough to hold 12 good ears of corn. There is also space for the date of packing and the "none genuine without" signature. During the forenoon these cards are folded up into boxes and so await the arrival of the corn from the field.

MAKING READY FOR PACKING

Picking is not begun until there is just time enough to complete the work of packing before nightfall. If the weather is hot, the ears are piled on tables over which play sprays from several sprinklers. This thoroughly and quickly cools the corn. The next task is grading. This means the selection of the very best ears for packing in the cartons, while the seconds are thrown aside to be disposed of as ordinary corn. During a recent season, with an unusually severe drouth, only a little over half of the pulling was fit for the boxes. Each carton is lined with paraffin paper brought over the top of the upper layer as the lid is closed. The box is then ready for shipment to the city, its contents fit to grace the next day's dinner table, fresh and plump and tender.

So far, so good; but how about the selling? This, as with all marketers, has been a most serious problem. When the first shipment was made, the Sunrise Gardens idea was unheard of and it was no

small task to build a trade. One morning the proprietor called up a first-class grocer and the conversation ran something like this:

"I have some sweet corn that is really good. I am sending it down and I want you to sell it at 25 cents a dozen."

"Can't do it. Market is 15." (Animated conversation between the two.)

"Well, I'll send it anyhow. You sell it at 25 cents or not at all. Tomorrow morning, dump any that is left over and I will bear the loss. I will have a fresh supply for you then."

So ten dozen went forward. The next day the order came for 15, and the next day for 30. Thus was the idea introduced to Buffalo. The struggle did not end here. It has ever been a task to get the retailer interested to such an extent as to give the scheme a fair trial. They always object to the high price, though their customers are glad to pay it in return for quality corn. Once, in the course of the present season, a grocer called up and said that

if the price would permit him to sell at 20 cents, he could handle twice as much. The grower agreed to try it for two weeks. Sales actually fell off. It was early found that the average commission man is not the one to handle a product of unusually high quality to advantage.

There is one question that has been lingering in your mind all the while, and now it is out. "This all sounds very nice on paper, but does it pay?" Any grower of sweet corn would be delighted if he was assured an average price of a cent an ear. Around 8 or 9 cents a dozen is probably above the true average for large growers. With this as a starting point, let us figure the cost and the returns, and then draw our own conclusions.

The package cost is in the neighborhood of 1 cent. The boxes can easily be prepared for packing at the rate of 100 an hour, while an experienced folder can do the work somewhat faster. The whole cost of extra handling is not over 1 cent a dozen. Add to this perhaps half a cent for extra selling

cost, and we have a total of $2\frac{1}{2}$ cents a dozen over the ordinary method of marketing.

Now for the returns. Over half of the crop from 30 acres went into boxes at 25 cents during the season, an unfavorable one. The seconds sold at an average price of 9 cents a dozen. The thirds furnished an abundance of excellent feed for the hogs.

The market gardener is more careful with grading and packing than the truck grower. This is caused by the fact that the market gardener is in contact with the purchasers in his market, and therefore, he sees more clearly how to attract the consumers to buy his product. The truck grower is generally some distance from the market, is not so familiar with the satisfying of the purchasers, and he ships, therefore, in larger packages and not in such an attractive way. However, if the truck grower is one who will place himself under the requirements of the house to whom he ships his corn, he will soon learn what is desired in order to receive higher prices for the product.

SHIPPING

Shipping does not apply to the market gardener. The market gardener, as a whole, carries the product to the market and sells it. The truck grower, however, generally has to depend upon shipments for sales. The shipments may go directly to large wholesale houses, or they may go to commission houses. The commission men charge a certain percentage on their sales, sometimes 5 per cent being their commission. The wholesale houses generally buy the corn outright and sell again to the retailer. If these persons, commission or wholesale, are reliable, and are willing to continue in business with the truck grower, it is found that sales through these houses are greatly to the advantage of the grower.

Shipments may be made under three heads: (1) By rail, either steam or electric. This seems to be the quickest method, and perhaps the most satisfactory, owing to the fact that, if rapid transit is given to the goods, there is less tendency for heating

of the product. (2) By water. It is often greatly to the advantage of certain truck growers to ship their corn by water, especially where the farm is located handy to these conditions. There are rivers and large bodies of water which will aid greatly if boats are available for transportation, the general tendency being that water rates are less than rail rates for the product. (3) By team or automobile. Automobile seems to be preferred if it is available. The product then can be carried over a distance of 20 to 40 miles in a short time, often even quicker than by rail.

There are, however, locations where none of the mentioned forms are available, and there the trucker has to depend upon the teams, horses and wagons, to convey his goods to market, generally delivering the goods to the wholesaler or to the commission houses. There is some advantage in the team method, because then the grower knows absolutely what condition his goods are in when they arrive at the commission or wholesale house, and there can be no letters

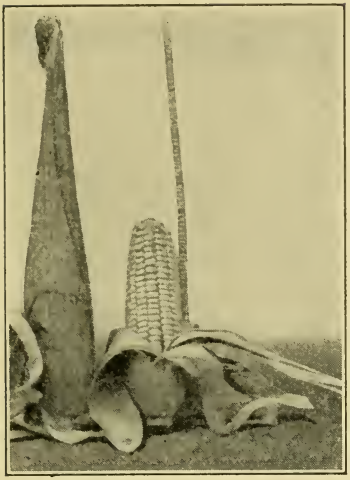
returned that the corn was not in good condition.

In shipping, the general tendency is that it adds to the expense of the crop, thereby, of course, increasing the total cost.

MARKETING

Not only do many market gardeners back their wagons into the public markets of the cities throughout the northern part of the country, but others retail their corn direct from their wagons on established routes. This is a very desirable way of selling corn, providing the grower has time to give to it. Generally speaking, the price is higher, the quality of corn sold is first class in every respect, and the money is cash in hand at once.

There are some men that would not care to go to the back doors of the houses and sell their corn. They claim this is an objectionable feature, as they have to deal with so many people in order to make their dollars, and they prefer to sell to the market in larger quantities.



Potter's Excelsior sweet corn.

Another method of selling corn at retail is in the home hamper. Here, with other vegetables, corn is generally included in season, the general principle being that, with the order for the home hamper, money is inclosed, and the corn is paid for, as well as the other vegetables, before it has been shipped or delivered. Some few men in various sections are trying the paper box, as mentioned under packing. This has proved quite satisfactory. The pack varies in size from a dozen ears up to three or four dozen. If the smaller sized pack would come under the parcel post, it could be shipped quite advantageously that way. Otherwise, it must be delivered by express.

The retail market as a whole offers generally the higher price to the grower.

THE WHOLESALE MARKET

There are several ways of selling corn at wholesale. The principal one among market gardeners is a stand in the market. Here the corn is brought in on the grower's wagons, the grower having a certain definite section of the market for his wagon, and the purchasers, such as stewards of hotels and clubs, grocery men, provision men, and others, come direct to the wagon and buy the product in quantity at wholesale prices. Oftentimes this method takes less time than it does under any other system.

Another way of selling at wholesale is to deliver the goods at the store, taking wholesale prices for them. Where a man has several stores or several hotels or restaurants, or other places where large quantities of goods may be sold, it often economizes his time to make sales in this way.

The truck grower may make sales at wholesale direct to large grocery or provision

houses, consigning in some cases whole cars of corn; or he may sell at wholesale in smaller quantities to stores or clubs or hotels. Sometimes the product can be sold to merchants in the city, who generally sell on a commission basis. In the former case, the purchaser will buy the corn outright, and then it is sold at a wholesale rate. As a general rule, the wholesale rate is not more than two-thirds of the retail price for corn.

When we find corn selling for 15 cents a dozen at retail, the wholesale rate will be 8 to 9 cents, in some cases 10 cents a dozen, in large quantities. Where there is a loss in the actual returns at wholesale for the corn, there is a gain in economizing time, and therefore in the money spent in selling the product.

CHAPTER XVIII

COSTS, YIELDS AND PROFITS

YIELDS

IT is very hard to determine the actual yields of sweet corn in the various sections of the country. As a general rule, it is found that the early corn does not yield as much as later varieties. However, the price for the early is generally a great deal higher. One finds that the very latest corns are oftentimes the heaviest yielders. The question of yields, however, may be changed by careful selection of seed by the grower, or some other improvement. The market gardener generally gives but two pickings to his corn. The corn stalks are then pulled out of the ground and discarded. Therefore, his yields are not so large as those of the man who will wait for some of the slower-developing ears.

The truck grower oftentimes has larger yields of corn. High yields of corn mentioned are from 15,000 to 20,000 ears to the acre. Low yields mentioned have been

scarcely anything, in some cases, 3,000 or 4,000 ears to the acre and less. A reasonable yield from an acre is 8,000 to 10,000 ears, and a fair yield which will give profit to the grower is about 1,000 dozen to the acre.

RETURNS

The returns vary greatly in different sections. The first corn often brings from 35 to 40 cents a dozen, even when sold in fairly large quantities. It is never, however, sold in very large quantities, because it is not produced in large enough quantities to be sold in that manner. A little later the corn drops to 25 and 30 cents a dozen, and from there on down to the small sum of 3 to 5 cents.

A great many years the average price throughout a state for corn is 8 to 9 cents a dozen. In some cases, it has been known to hold to 1 cent an ear throughout the season. For the early crop, on the average, the figures would be about 25 cents a dozen by the 100 dozen. The midseason crop would average from 12 to 15 cents a dozen,

and the late crop from 8 to 10 cents a dozen. Some years these figures are too high and other years they are decidedly low.

PROFITS

Early corn seems to be the most profitable, owing to the fact that higher prices are obtained. It is often common for a man to gross $120 to $150 for an acre of early corn. The midseason would drop to $75 to $100 an acre, and the late corn often only $40 or $50. The cost of producing corn varies greatly, the early corn being the most expensive, sometimes running $75 an acre — in some cases more, in others less, leaving a profit of anywhere from $25 to $75 an acre. Midseason corn costs

Ne Plus Ultra sweet corn.

less than the early corn to produce, generally $50 to $60 an acre, in some cases less, which would leave a profit of from $25 to $50 an acre for the product. The late corn seems to give the least amount of profit, generally only $15 to $25; sometimes as high as $40 is netted from an acre.

To this must be added the cornstalks. In a great many cases, the cornstalks are worth from $7 to $15 an acre. Market gardeners in many sections are so anxious to get rid of the stalks after the second picking of corn that they will gladly give the corn to any farmer who will come and remove it from the ground. In this case the corn and roots are removed bodily. It is often possible to see a market gardener having some of his neighbors remove his sweet corn from the ground, immediately following by plowing, manuring, and placing another crop on the ground, almost on the heels of removing the cornstalks. In this case, the cornstalks are not of any value to the grower.

The truck grower, however, may keep cows, and the cornstalks will serve as a crop for his cows, either as green feed or in a dried condition as a substitute for hay. As a general rule, from the figures available, the average value of an acre of cornstalks would be about $8.

CHAPTER XIX
ROTATIONS

THE market gardener, owing to the high price of the land which he is working, cannot rotate the crop of corn with other low money-producing crops. He must necessarily rotate his corn crop with vegetable crops, as returns that are fairly high must be made each year from his expensive land. The general condition is, then, that corn is rotated with the root crops, such as beets, carrots, parsnips, or it may be rotated with spinach, lettuce, celery, and some other vegetables.

The truck grower on his less expensive land can rotate the sweet corn crop with vegetables, sometimes potatoes and cabbage, or he can use corn in rotation with farm crops. The corn may be followed by a small grain, such as oats, following that with grass for one or two years, then plowing down and using corn on the land again.

In both cases there seems to be a great need for rotation on the land. We find

that, where corn has been grown on land year after year, there is a decrease in returns of the corn crop, owing to the fact that the corn exhausts the soil of the food elements which it takes up in its growth. Where other crops are grown on the land,

Extra Early Cory sweet corn.

the general tendency is that there is not as great a drain on the plant food as is taken up by one continuous crop. Therefore, there are advantages in growing corn with other crops.

Besides these advantages, in the case of the truck grower it is found that it is a great advantage to turn under a crop, such as the stubble or grass, in order to increase the humus content of the soil. The trucker generally is not so well located as the market gardener, and therefore, his supply of manure is rather limited, and he cannot build up his soil physically by the addition of the limited amount of manure he may use, so he must revert to the use of crops, such as clover or grass, to increase this physical condition of his soil. Any system of rotation which will give every third year or every fourth year a crop of sweet corn may be very beneficial to the land and profitable to the crop.

CHAPTER XX
FORCING

UP to date the possibilities of forcing have not been emphasized greatly. There have been a few men throughout the United States and in the mother countries that have practiced this method of growing sweet corn. On a commercial basis, there have been but few who have tried it. However, with the growing demand for sweet corn and other vegetables out of season, there seems to be some demand for the product, and the following method may not be misplaced in this book on sweet corn.

Sweet corn may be grown in greenhouses on ground beds, planting the corn about 18 inches each way, generally about three stalks being allowed to develop in each hill. In the early stages of the corn's growth, the remainder of the ground may be utilized by the growing of some quickly maturing crop, such as radishes, lettuce, spinach, or some other crop.

The corn requires for its best development about the same temperature that the warmer forced plants, such as melons, cucumbers, and eggplants, require—a temperature of 60 to 70 degrees during the night and 10 degrees or so higher during the day. It is, however, very important that the atmosphere of the house should be kept rather moist until the pollen begins to fall. Not only should the air be kept moist, but the soil should never be allowed to become dry.

The soil requirements for the corn are the same as for the other warm weather crops mentioned. Any good greenhouse soil would be satisfactory. As we find sweet corn is a gross feeder, it is well to have the soil quite rich.

It has been determined that it is possible to mature some of the early varieties of corn in from 70 to 85 days. The variety of corn will govern the height of the house above the bed. The glass, however, should be from $3\frac{1}{2}$ to $8\frac{1}{2}$ feet above the bed, according to the height of the variety which is

grown. It has been found that corn grown under forced conditions has a tendency to sucker very profusely. In order to increase the strength of the plant and aid the development of the ears, it seems best to remove these suckers or stools by pruning. Sometimes it is advisable to remove the tassels from the corn, especially in the springtime, when there seems to be an abundance of pollen. However, for the winter crop, the tassels should not be removed, as there does not seem to be pollen enough for pollination.

Some of the varieties which have been successfully grown under glass are White Cob Cory, First of All, Early Crosby, Early Fordhook, and Beverly. The crop should mature before July in order to be remunerative. Otherwise, it will come in competition with southern corn and with the early corn from the neighborhood.

As far as known, the only pests in the greenhouses are rats and mice, which have a tendency to dig out the seed, also to eat the mature corn. It is, therefore, advisable

Zigzag Evergreen sweet corn.

to destroy these pests before the corn is planted.

Another method of forcing is that of growing the sweet corn in hotbeds or cold frames. Here, towards the end of the hotbed season, corn may be planted in the hotbed. Some growers practice the method of growing a crop of lettuce in the hotbed, following this by planting seeds of corn and radishes at the same time. The radishes are matured and the corn is allowed to develop. Generally speaking, the corn is not planted so far in advance that, when it is pushing the glass for room and the sash must be removed, it may be injured by frosts. In the cold frames it is often possible to start the seeds quite early, sometimes very nearly as early as started

in the hotbeds, later removing the sash and allowing the corn to grow at will. In both of these cases, some quick maturing crop, such as lettuce or radishes, is grown at the same time, so that the space in the bed is not limited to merely the corn crop.

To a great many people these last two methods seem to be the most feasible for growing sweet corn very early, because the expense of growing under these conditions is not as high as growing in the greenhouse, nor is the investment as large. Where the commercial grower has a selected market which is willing to pay a high price for the product in advance of the season, it is quite advisable for the man to use these methods of producing corn.

CHAPTER XXI

BREEDING AND CURING

DR. Byron D. Halstead of the New Jersey station has given much attention to the breeding and selecting of sweet corn. Some of his interesting and practical work follows. From the practical breeder's point of view, there is much of interest in sweet corn. This vegetable is far from having reached perfection. When one encounters an ear that is good he is apt to remark that there is nothing better than an ear of such corn—unless it be two or more ears. The great difficulty with the whole sweet corn industry is the lack of knowledge on the part of the consumer of what high qualities this vegetable may possess. As a matter of fact, there are but few consumers in the great cities that ever get the best. There are those who know and are willing to take great pains to get real sweet corn and have it freshly picked; that is, brought directly from the field to the pot.

"Any corn served hot upon the cob with plenty of butter and salt is generally acceptable, and the idea of a large size of ear along with moderate cost has the sweet corn industry by the throat. No one rec-

Sweet corn should be planted in more than one row in order that proper pollination may result. Commercial gardeners plant sweet corn in solid blocks.

ognizes this more than the grower, and so long as it pays well, he is willing to serve inferior corn.

"Sweet corn is a tender corn to grow and the yield is smaller to the area than that of a poorer sort. Sweet corn cannot with safety be planted as early as starchy corn,

because it is more subject to decay, and as a result, starchy sorts are often represented in the early supply of table corn. Many consumers do not know that there are early kinds of true sweet corn; the ears may not be as large as the late sorts, but the grains are as sweet and when dry as wrinkled as those of the standard sugary sorts.

"A grower need not make the excuse that there are no sweet early corns—they may not be quite as early as the Adams, for example, but when they do reach the table a few days later, they are keenly relished by any who have a fondness for this king of vegetables.

"Sweet corn needs to have its high qualities standardized and associated with those heavier ones that are common to the field sorts. The commercial grower is inclined to the opinion that the sweet corn is necessarily a weak plant, needing more attention and then yielding less than an ordinary starchy sort, and therefore he grows the latter and gathers it so early

that it does not show its starchy nature, but a watery content instead. For his sake, it will be assumed that the practical grower is right—that is, the sweet corns, as they are found, are not vigorous and prolific—and so long as he is not forced to do it he will grow the inferior and more profitable sorts.

"There is a way of breeding into the varieties of sweet corn much of the size and strength of plant manifested in the field sorts of the great corn belt. To this end, there is a very fortunate opposition of qualities by the aid of which the breeding of this crop can go forward with remarkable rapidity.

The texture quality of the grain, whether it is starchy or sugary, is a combination that does not blend but alternates; that is, when the two extremes are bred together the combination is always starchy, as the immediate result, but later there is a segregation and the sugary separates itself. We have previously assumed that the sugary sorts need to be strengthened in the whole

plant so that the roots will feed wider and more actively, and the stem be stouter and the leaves larger and more numerous for a greater result in size and number of ears. Under the rule of dominance of the starchy factor in corn, it is only necessary to plant the two kinds that are to be bred together in parallel rows side by side, and have them come into tassel and silk at the same time. To thus grow an early and a late sort planted at the same time would be futile; but, knowing the difference in the time required for the two kinds to blossom, the plantings can be quite easily adjusted to accommodate this matter.

It is supposed, for example, that both kinds are white corn and they have grown side by side. At harvest time it will be observed that a large number of the grains upon the ears borne by the sweet corn stalks are starchy; in other words, the shelled corn for such ears may at once be separated into two lots, the ordinary sweet grains like the ones that had been planted in the spring, and a second lot

that are like field corn in being smooth and starchy. These grains are not necessarily like those of the starchy sort that were planted alongside of the sweet corn. While the male parent has communicated the starchy nature immediately to the grain, it has not brought about a change in the size, shape, etc., of the grains. The mother has controlled many things, but she was not able to keep the grain sweet.

"If we turn to the ears that were borne by the alternating rows of strong field corn, it is noted that they are all starchy—that is, the sweet corn has not been able to impress itself upon the grains—and, so far as appearance goes, the crop is pure of the mother parent type. Should one wish to test this matter, it is only necessary to plant a quantity of these starchy grains in a patch by themselves and note the result as determined by the ears that follow. Instead of them being all starchy, the chances are that there will be many that are sugary, as indicated by the wrinkled surface; in fact, they will resemble the grains

of the sugary grandparent in the single factor of sweetness. By separating these sweet grains from their starchy mates and planting them under isolation, the breeder will have a pure sweet corn, there having been no starchy factor in any that was planted; for if there had been, the grains would not have been sweet.

"In some particulars, this new cross may be different from any previously known kind of sweet corn, and in some particulars there will be a blending of the factors that are of the same sort. Thus, while the sweet parent plant was of medium height, the cross may show a taller stalk and midway between the two parents. In the same way, the ear may be larger than one or smaller than the other; and, for example, should the sweet parent have eight-rowed ears, the cross may show the number of rows, ranging from 8 to 16, the latter being the number of the field sort.

"To return to the original cross, it was noted that the starchy male parent impressed itself at once upon the sweet female parent,

PRODUCT FROM UPPER EAR SELECTION.
Courtesy Rhode Island Experiment Station.

PRODUCT FROM LOWER EAR SELECTION. (Compare with Page 112.)
Courtesy Rhode Island Experiment Station.

and upon the ears of the latter there were many starchy grains. By planting these starchy cross grains a certain definite ratio between the starchy and sweet grains will appear in the next generation, namely, three of starchy to one of sugary. These sugary grains are free from the starchy quality, and will, when planted under isolation, produce a new sweet sort of corn, and probably practically the same as that described above, when the sweet strain was extracted from the starchy ears borne by the field variety. The parents are the same in both cases, but the combination was opposite; that is, the male in the one cross was the female in the other."

BLOCK FOR SWEET CORN BREEDING

In continuation of the work of breeding sweet corn, it will be supposed that the person who would essay the task is quite ambitious, and with a single block of corn wishes to make more than one cross at the same time and yet have each one free from any mixing with the other. It was shown

in the previous section that a cross can be made in safety in the open field—that is, without the removal or protection of flowers—by having one parent represent the starchy and the other the sugary type of corn, the so-called sweet and field sorts. Of course this factor of grain texture may be here employed, which will provide for one cross. But others may be secured by involving other characteristics of corn.

In the first place, it will be necessary to decide upon the stock and the breeders, and as the sugary is the type that shows immediate influence of the male, it is selected, while the male sorts may be termed the breeders. The question now is as to a quality of corn other than grain texture that will admit of immediate influence. This is found in the color of the grain, and is best shown by an example.

Let one grow a white (colorless) corn in parallel rows with yellow corn, both being either sweet or starchy, and the result will be that the white ears will show a mixture of yellow; that is, the pollen for the yellow

sort has impressed that parent's peculiarity of color upon the grain of the immediate cross. On the other hand, there has likely been as much mixing of the white upon the yellow, but it does not show in the yellow ears and they look pure. This is because the yellow color is dominant, and the white consequently hidden or recessive. It is easier to see how yellow can exclude the appearance of white than that a starchy grain impresses through its pollen the factor of starch-bearing upon the cross.

Now, to return to the block of corn, it is seen that if the stock is a colorless sweet sort, one breeder may be a yellow sweet, and the cross may be separated out with safety, provided no other yellow sweet kind is used as a breeder.

In the same way, another cross may be secured upon the same block of white sweet stock plants by using a sweet black sort; for in this case any grain that is a cross between these two will be a dark sweet grain, and may be separated by planting them under isolation the next season.

Thus far, three crosses have been provided for, namely, (1) of a yellow sweet, (2) black sweet, and (3) white starchy upon the stock of white sweet corn. Names of commercial sorts might be named for the sweet white stock and the three breeders, but it might only confuse instead of simplify the statement. If one uses a yellow starchy sort, a field flint (or dent) yellow, for example, as a breeder, will there be any danger of a mixture so serious that separation is hopeless? In case of the yellow, starchy breeder, there are two dominants, one of color and the other of texture, that will work upon the white sugary stock, and each grain that is a cross will be both starchy and yellow and therefore marked, as none others thus far considered, upon the ears of the stock plants. The yellow carried by the sugary yellow breeder makes no trouble, because all the grains containing the parent are sugary and therefore wrinkled—they are no more difficult to separate than field yellow and sweet yellow grains.

In the same way, it is possible to breed with safety upon the same stock of plants a black starchy sort, for in such an event the crossed grains as found upon the stock plant ears will be both dark and starchy, and for that reason may be quickly separated from all other crosses.

It is seen that the above outline for open breeding accommodates five breeders or pollen-bearing plants, the offspring of each of which can be easily distinguished from each other. An ear of the stock under these conditions will be very striking in the mixture of texture and color of its grains. There will be the (1) yellow sugary, (2) black sugary, (3) white starchy, (4) yellow starchy and (5) black starchy, all accounted for by the breeders employed; but besides those there will be more or less of a white sugary type that results from pollen of the stock plants themselves, which is pure to the mother variety, even though surrounded by the five other combinations. If the breeder had taken the trouble to detassel all the stock plants, then probably

the ears thus produced would have been full of grains, but all would have been crosses.

Such a breeding block as above outlined may well consist of at least a half of the stock plants and the other half divided equally among the five breeders. Thus, rows 1, 3, 5, 7, 9 and 11 may be the white sweet variety that is to become a mother of all the crosses, while rows 2, 4, 6, 8 and 10 are planted with the five breeder sorts respectively.

It is seen that a small block of white sweet corn may become the breeding ground of various crosses, but the next generation calls for isolation for each of the crosses thus obtained. It is, in other words, a comparatively easy matter to get a cross with corn, but it is quite another matter to separate out and bring to perfection the cross obtained because of the extreme ease with which the pollen is transported by the wind.

If the reader is seeking for a tangle in corn breeding, let him take the grains that

make up the ears of the dark starchy breeder in the above breeding block. Bear in mind that black covers all colorless sorts and starchy obscures all sugary blood, and therefore there is no assurance that any particular grain has as its pollen parent a white sugary, a white starchy, a black sugary or a black starchy type. Furthermore, the yellow of either a sugary or a starchy parent may be hid by the black of the mother parent. To work further with such a mixture has scarcely more than theoretical value, especially for the dominant qualities, for they will long show recessive; that is, the obscured peculiarities which the fortuitous combination of the parents permit.

Some crosses of sweet corn which have been made are:

Malakhov x Premo
Malakhov x Crosby
Golden Bantam x Country Gentleman
Golden Bantam x Premier
Golden Bantam x Stowell's Evergreen
Golden Bantam x Banana
Adams x Crosby

According to the Arizona station, eastern varieties of sweet corn do not succeed in the arid Southwest, even though irrigated abundantly. This failure is caused by a lack of pollination due to the desiccation of tassels and silks during the hot, dry season. Under these conditions, moreover, all varieties of corn have a tendency to tassel and lose their pollen before the appearance of the silks. The small varieties of Mexican and Indian corn native to this country are much less subject to these losses. Being thoroughly acclimatized, they have pollen and silks which are more resistant to heat and dry air, and are thus better able to set a crop during the warm summer months.

Practically all green corn sold for table use on the local markets consists of these small field varieties of Mexican and Indian origin. The quality is poor, lacks the sweetness of a true sweet corn, the ears are small and the grains shallow and tough. In the summer of 1910, during a sojourn among the Papago Indians in the desert

valleys between the Baboquivari and Quitotoa mountains, attention was called to a few ears of the true, southwestern Indian or Squaw corn which contained a number of wrinkled, sweet grains. These ears were secured, and from them a race of native sweet corn has been isolated. Two generations have been grown and an abundant supply of pure sweet corn secured. This variety retains all the hardiness and heat resistance of the native Squaw corn, and although the ears are still small and the grains rather shallow, the quality is much better, being sweeter and more tender than ordinary field corn.

This new variety is now being bred by the ear-to-row method with a view to increasing its productiveness and the length or depth of the grains on the cob. It is encouraging to note that several of the rows in 1911 tests exhibited considerable superiority in these respects over their neighbors and gave promise of strong variation in the direction desired. The row planted from parent ear No. 6, for instance, yielded

more than twice as much as the combined yields of the two rows on either side of it.

The Rhode Island station has carried on some valuable experiments in the selection of sweet corn. The author, while a student at that college, had direct charge of these experiments for two years. The experiment was undertaken for the purpose of determining the influence of selection in increasing the number of ears to the stalk. Two different lines of work had been followed. In one, the seed was always taken from the lower ear, and from a stalk producing the largest number of ears. In the other, seed was always chosen from the upper ear of stalks producing the largest number of ears. The variety used in this test was Potter's Excelsior.

Some very startling results were obtained. The results are in harmony with the general law which seems to prevail throughout the plant world, that it is the characteristics of the parent which produce the seed which are likely to be perpetuated, rather than the characteristics of the condition or type

of the individual seed itself. Since this question has been answered in reference to sweet corn, the selection from the lower ear has been abandoned, and selections from that time on have been from the stalks producing the largest number of ears. This would be of interest to men engaged in the selecting, to know that the number of ears produced on a stalk can be increased somewhat by proper selection.

If it is possible in the future to breed a sweet corn that would produce three good marketable ears of sweet corn to the stalk, there would be a decided increase for the market gardeners in the returns from an acre of sweet corn.

For many years it has been my custom to select for planting a number of ears having as many of the most desirable characteristics as possible. As the main point was to obtain extra early corn, it was found that earliness is maintained only by saving the earliest ears from the early corn, and from these earliest ears a small number, known as "double extra," are set

aside for the breeding plat. In selecting these extra double ears, it is important to notice closely not only size, length of grain, and length of cob, but also the character of the corn for quality, as denoted by its translucent appearance. The most rigid selection is practiced; that is, to have a choice number of ears of the right kind, and to be sure not to plant any but the best in the breeding plat or near it.

CURING

Sweet corn molds and ferments more easily than field corn, even more so in the South than in the North, and it is liable to be injured by freezing, expecially in the northern states. Both of these factors result in greatly injuring the germination of the seed. From the above-mentioned particulars, it is found that the proper curing of the ears is one of the most vital factors in the sweet corn industry.

From experience in curing corn, it has been deducted that corn which is placed in stacks with the ears remaining on the

stalk, until the husk opens, will be injured by a spell of damp, hot weather, causing discoloration of the kernels. However, if the weather is both cool and dry, and no injury by freezing results, the sweet corn cut and shocked like field corn will not sour before it dries.

Corn which has been thrown in a large pile with or without the husks on will, inside of 24 hours, develop enough heat to injure the germ, discolor the kernels, and cause the cob to sour.

Even fire heat has not proved entirely satisfactory when used to dry the corn, owing to the souring of the cob before it has time to properly dry out. If, however, the ears be husked out on a dry day and allowed to lie exposed to the direct rays of the sun for a few hours, the organisms which cause fermentation are killed, and a layer of impervious matter is formed over the surface of the corn and the butt end of the cob, which makes it more difficult for fermentation to start in either corn or cob.

After following many recommended methods, which often proved very laborious and in most cases vexing failures, the following method of curing sweet corn has been developed. After the plants show that the corn is mature and the husk is dead and beginning to be loose on the ear, select a clear, bright, sunny day, begin early in the morning, and cut down as much corn as can be conveniently husked out in two hours or a little more. Throw the stalks as cut into piles on the ground, locating them so that they will be convenient for rapid work in husking. After dinner, husk out the corn as rapidly as possible, and throw the ears into small piles either upon the ground or upon sacks spread out upon the ground. The bright sun's rays upon the ears will kill the organisms which cause fermentation and also produce a formation of impervious matter over the surface of the corn and the butt of the cob.

Before the setting of the sun, haul the corn into the barn or storehouse. Have provided in either of these places a slatted

floor made as follows: Strapping 1 inch thick by two inches wide, nailed as a floor upon 2 by 4's, allowing a space of 1 inch between strapping. Inch-mesh galvanized chicken wire can be substituted for this strapping. The ears of corn are then brought in and placed upon the floor in piles similar to "jack straws"; that is, crossed in every direction, many of them standing in nearly a vertical position. When all is done, the floor is covered with very loose corn about a foot deep. This arrangement of the corn upon a floor of the above construction permits free circulation of the air between each ear, aiding proper curing of the corn.

In the above position, the corn dries very quickly and may be put into barrels as soon as all moisture is out of the cob, or it may be allowed to remain on the rack until wanted.

CHAPTER XXII
INSECTS AND DISEASES

THE corn is troubled by a great many insects and diseases in various sections of the country. However, we do not find all of these insects and diseases common to all sections where sweet corn is grown.

DISEASES

Rust. One of the diseases most commonly mentioned in some sections is the rust. This affects the leaves and the leaf sheath, and in some cases causes considerable injury to the development of the tissues. However, on sweet corn it has not become common only in certain sections, and therefore has not received a great amount of attention.

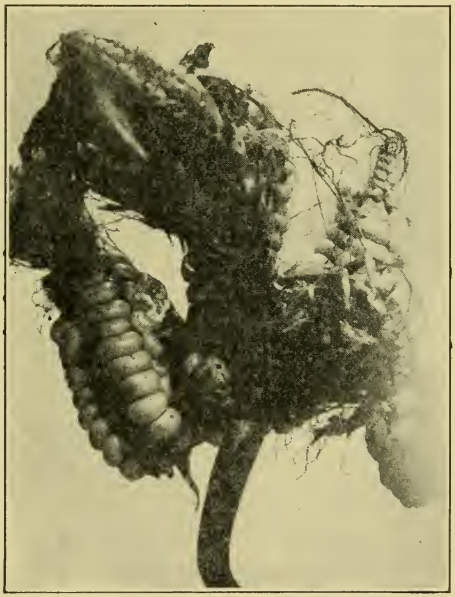
Smut. Smut is the most common disease on corn throughout the United States. About every field of sweet corn that is planted has on some stalks or ears a large, whitish mass, which increases in size and later in the season turns black, sending

out a brownish-black powder. This is the so-called smut of corn. The fungus may gain entrance to the sweet corn at any time, and the control would be along the lines of cutting out the disease before the material has turned dark colored and the small spores or dust is thrown out by the body.

Another very important fact concerning the fungus is that, if the stalk is cut and placed on the compost pile, the spores will live over winter, and when the compost is placed on the land in the spring the spores will be ready to develop upon the plant. From this, it would seem, the statement has been put forth by a great many farmers, that manure applied to sweet corn has a tendency to increase the amount of smut. It would be much better for the grower to destroy the smut by the use of fire.

In some sections of the country the loss averages as high as 25%. In other sections, where care has been observed in keeping down the amount of smut, the loss is 5% or less.

Wilt. Another disease which in some sections is becoming more common on the sweet corn is the wilt. Long Island seems to have discovered the disease first. From this section it has been reported in other parts of New York and as far west as Iowa. The plants that are affected wilt or drop



Multiple, hermaphroditic and diseased (smut), all on one stock.

quickly, and it is seen that the water supply has been cut off and the plant soon dries out. The leaves are the part first noticed to be affected; at first one and then the other dies until all are dead and fall off. Where the plant is very small all the leaves may wilt at the same time and the plant dry up, being soon lost.

As far as known, no control methods have been practical. There seem to be, however, one or two measures which have been employed which may be of value in checking the disease. Pure seed from corn which was not affected should be used. This is highly important. Another method would be rotation of crops so that corn would not be placed on the same area more than once every three or four years. It has also been noticed that in some cases certain varieties are not so susceptible to the disease, and it might be greatly to the advantage of the grower to plant varieties which are less subject. These seem to be the only practical measures thus far discovered.

INSECTS

There are in certain sections a great many insects which trouble sweet corn. Some of the most common will be given here.

Bill Bugs. These insects belong to the genus Sphenophorus, and generally are brown or black in color, sometimes being grayish, about one-quarter to one-half inch in length. The wing covers are generally thick and hard, and somewhat rigid and punctured.

During the day the bug hides in the soil at the base of the corn plant. Later, it bores small, round holes in the stem, resulting in killing the plant. They are very common in old sod, especially where bulb-rooted grasses and sedges are common. However, the length of time during which these insects are injurious is usually very short; and by delaying planting, the new shoots may escape the attack. Fall plowing is a great aid in controlling the insect.

Root Louse. There are several insects which attack the root of sweet corn, the root louse being perhaps the most common. The louse is greatly aided by the ant,

which gathers the helpless forms of the louse upon the roots of the corn in the spring. The general remedy is to fall plow and destroy nests of ants. Sometimes an application of kainit or nitrate will prove very effective in destroying these insects.

Diabrotica. Another root insect is the corn root *Diabrotica*, common in the western and central states, of a pale green color with very long antennæ. The larva of the insect is a serious pest to corn. It never becomes serious unless corn follows year after year. Therefore, rotation would easily control this pest.

Root Webworm. The root webworm is sometimes common. However, it is only injurious where the grass has run out. Where a grower practices a good system of rotation with the grass crop it will be found that the insect will bother very little.

Corn Worm. The insect that seems to be attracting common notice is known as the corn worm. In the South it is called the boll worm. This worm eats the kernels of the corn generally at the top of the

ear. It is, therefore, very difficult to control the pest. The insect also attacks other plants besides corn, but it prefers corn to anything else. Lately Missouri has been able to demonstrate that applications of arsenate of lead in a dry form applied to the ears of corn have proved quite effective in controlling this insect. More detailed matter upon this question undoubtedly will be forthcoming in a short time from that station.

Borer. There is an insect quite common in the South, known as the larger cornstalk borer, which affects sweet corn at times, starting in at the base of the roots and boring into the interior of the stalk. Sometimes it affects the leaf by punching holes through the same. The principal treatment is rotation of crops, especially so if rubbish from the field is done way with and crop rotation is practiced. Spraying does not seem to be practical in controlling insects and diseases of sweet corn. It seems best to practice the more common method of rotation in every case, with improved sanitary conditions of the field.

CHAPTER XXIII
VARIETIES

ANY author who puts forth varieties of vegetables or fruits is always open to criticism for choosing the varieties mentioned. The author of this book realizes the disturbance he may create by mentioning certain varieties under different heads. However, it is hoped that there will be some who will agree with him on varieties chosen under the three heads.

It would seem best to divide the varieties of sweet corn into three classes as far as possible, and include in these classes the corns that are most commonly offered for sale by the leading seed merchants throughout the United States. It is the intention of the author to classify the sweet corn under but three heads: first, the early, which would embrace naturally the extra early corns; second, the midseason, which would embrace some of the so-called early corns and those which would mature a little later;

and, third, the late corns, which would in some cases include corns which are produced a little earlier than the extreme late corns.

EARLY SWEET CORNS

The first three varieties of corn which are included under this list are not, strictly speaking, sweet corns. They belong to another order of corn. However, they are grown so generally throughout the United States as sweet corn and sold on the market for this purpose that it seems best to include them here.

Adams Early. Not a true sweet corn. It is a southern variety with a stalk 7 to 8 feet tall, producing ears 8 to 10 inches long, which are set well up on the stalk. The husk is heavy and the corn is ready to eat very early in the season. It is consumed in the water stage of its growth.

Extra Early Adams. Probably an improvement on the Early Adams. It is a very hardy corn, growing to 6 or 7 feet tall, being 7 to 10 days earlier than Early Adams. The ears are slightly smaller than

Early Adams. The grain is tender and white, and very good for so early a corn. It needs to be harvested very promptly in order to be of any value for consumption.

Adams Improved. Sometimes called *Dreadnought.* It is another selection of Adams Early, and is slightly earlier in season and a little larger, finer ear than the Early Adams. Otherwise than that, it has but few, if any different characteristics from the first.

Aristocrat. This is a reliable variety which for a number of years was controlled by a gardener at Newport, R. I. The gardener was able to produce a corn which was extremely early. Therefore, he was able to obtain a high price for his corn. The stalk grows generally 4 to 6 feet high and the ears from 8 to 10 inches long. The grains are extremely sweet for such an early variety. They are decidedly broad.

Best of All. It is a stocky growing plant about 5 to 6 feet tall. The ears are large, averaging about 8 to 9 inches in length. The kernels are broad, quite sweet,

white and tender. By some considered a very desirable early corn.

Early Catawba. This corn is similar to Golden Bantam in growth, and by some considered to be earlier than Golden Bantam. It differs in the color and the flavor of the kernel. The grains are pearly white with a rose-pink when ready for consumption. The stalk grows to the height of 4 to 5 feet, the ears 6 to 7 inches in length. Rather slender, eight-rowed. The plants have the habit of suckering very freely. The dry seed is a rich purple shaded with rose. The cob is small and white.

Chase Early. This variety is said to be as early as White Cory. The foliage is very heavy, shaded with dark red. The stalk is about 5 feet tall. The ears are set low, the kernels being white and rather sweet. The size of ear is 6 to 8 inches, having eight rows of kernels.

Extra Early Cory. Sometimes called *Early Red Cob Cory.* This corn succeeds very well where the season is short, cool and moist. The plant averages $3\frac{1}{2}$ to 5 feet and requires

A poor example of a very high quality corn—Quincy Market.

from 54 to 77 days to mature. The ears are 5 to 7 inches long, with a red cob and very broad grains, arranged in eight rows. The kernels are white with a reddish tinge.

Cory, White Cob. Also known as *First Crop Sugar*, *Mammoth Early Cory*, and *Improved Extra Early Cory*. A 50 to 60-day corn, with stalks dwarf, stocky, and, when planted close, from 3 to 5 feet in height. The ears are 5 to $5\frac{1}{2}$ inches long; very white kernels on a white cob. The kernels are eight-rowed. It is a very desirable variety for the home or for commercial market.

Cosmopolitan. Later than Cory. The stalks are 5 to 6 feet high, with the ears

7 to 9 inches long, containing 10 or more rows of large grains, filling the ear well to the very tip. Cob is white and quality very good.

First of All. The stalks are dwarf and very thick. Ears are of medium size, with 10 or 12 rows of broad grains. Flavor good. Ripens 2 to 7 days before Cory.

Fordhook. The ears are 6 to 7 inches long, and eight-rowed. The grains are deep, making the cob small. Fordhook ripens two or three days earlier than Cory. Grains and cob white, and stalk is similar to Cory.

Golden Bantam. Stalks about 4 feet tall. This corn has ears 5 inches long and eight-rowed. There is a delicious, sweet flavor, and the corn is very tender. Grains a deep yellow. The seed is firm, and therefore can be planted earlier. The skin of the kernels is tender. The variety is recommended for the home garden.

Golden Sweet (Carpenter's). An improvement of Golden Bantam. It does not have the mealy taste of other yellows.

Hiawatha. Plant 5 feet tall. The ears are about 8 inches long, plump and well filled with pearly white grains. The corn is tender and sweet. It is ready to harvest in nine to ten weeks.

Ideal. Stalks 6 feet high. A very vigorous, stocky grower, maturing in 70 days. Ears are large, rough and irregular. There are usually 14 rows, the grains being large, flat and short, the ears 7½ to 12 inches long. The flavor is good and the variety prolific. A yield of 6,000 ears on less than an acre has been reported.

Kendall's Giant New Large. Ears 7 inches long. The grains are pure white, sweet and tender. The ears are thick with 10 to 18 rows, most ears having 12. The variety is prolific. On warm, sandy land, it ripens in 60 days, and on other types of soil may sometimes require as much as 72.

Lackey's Early Sweet. Stalk 5½ feet high. It is two or three days later than Cory and requires 58 to 65 days. The ears are white, one-third larger than Cory, eight-rowed.

Livingston Early Sugar. Stalks 6 feet high, suckering freely. It is a dry-weather corn. The ears, which are 6 to 7 inches long, are set 20 to 30 inches from the soil, and have 10 or 12 rows. The kernels are broad and deep. The husk is strong, the cob white and the corn sweet.

Malakoff. Stalk 3 feet tall. The kernels range from white to pale amber, and have a sweet flavor. The variety is a week earlier than Cory. If planted May 12, ears may be obtained by July 4.

Maine Early. The ears of this variety are large, with but eight rows. Both grain and cob are white. Extra early in ripening. It is a desirable market garden variety.

Mayflower. Extra early, white. The ears are large and well filled, sweet and tender, 12-rowed. One of the earliest in vicinity of Boston, Mass.

Metropolitan. Stalks 5 feet tall. An extra early variety, a few days later than Cory. The ears are larger, 9 inches long, with 10 or 12 rows. The husk is thick. The leaves are numerous, narrow and of

a dark green color. The ears are set low. Recommended for market and shipping.

Minnesota. Stalk 4 to 5 feet tall. Sometimes called *Ford Early* or *Early Minnesota.* This corn is notable for its strong growth. Ears 5 to 7 inches long. Sweet grains in 8 or 10 rows. Both cob and grain are white. The variety matures later than Cory, the season being 58 to 82 days in length.

Nordheim. Stalks 5 to 6 feet in height. Size of ear 5 to 6 inches in circumference, with 8 or 10 rows of kernels. Like Minnesota. An early, sweet, tender variety of fine quality. Prolific. In Connecticut it matures ready for table use 60 days after planting.

Peep o' Day. A very early and prolific variety. The stalks are dwarf, growing $3\frac{1}{2}$ to $4\frac{1}{2}$ feet apart. Ears are 5 inches long, having a very perfect form. Foliage light green. The variety is good for forcing under glass.

Pocahontas. Selected from White Cob Cory. Three days earlier than Cory. Ears stout and well filled, grains tender.

Premo. Stalks 5 feet high, vigorous and healthy, but slender and short jointed. Being hardy, this variety can be planted early, and it ripens extra early, as it is a 60-day corn. It is sweet, tender and of a good flavor. The ears are 6 inches in length, rough, and irregular. The grains are short, broad, thick and of a creamy-white color.

Sunrise. The ears are large, and have flat grains which are deep, tender and sweet. Good for all purposes.

MIDSEASON VARIETIES

Bearsfoot. Also known as *Concord.* This variety has a large ear, rather flattened at the end. The quality is good.

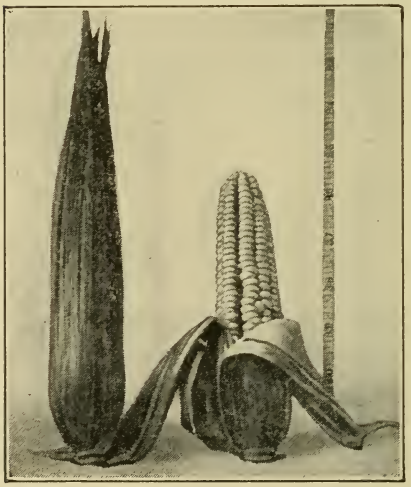
Black Mexican. Stalk 6 feet tall. Ears 6 to 8 inches, eight or 10-rowed, grains flat, white, turning to purple and black. The grains are fine and very sweet. The cob is white. Ripens in from 66 to 93 days.

Burlington Hybrid. Sometimes called *Adams*, but of better quality than Adams. Of large size and good appearance.

Champion Early. Stalk 5½ feet, stout and vigorous. Ears are large, 6½ to 7 inches, with 12 rows of sweet, tender, white grains, which are large and flat. This corn remains in good condition a long time.

Colossal Maule's. Stalk 6 to 7 feet tall. Ear 7 to 9 inch with 12 or 14 rows. Flavor sweet; tender. Crop matures in 70 days on the average.

Columbus Market. Stalk 5 to 6 feet high; strong. Leaves are broad and dark green. Ears contain 16 rows of large, deep, white grains, which are sweet and tender. A good variety for both market and home use.



Black Mexican, the sweet of all sweet corns.

Crosby, Josiah, Crosby Strain, or *Boston Market.* Varies in height under different conditions. In New York it grows to 5½ or 6 feet, in Illinois 6 to 7 feet, and in Michigan 3 to 4 feet. Very dwarf, distinct from Crosby. The ears are of a good size, 6 to 7 inches, and set low on the stalk. The white kernels are in 12, 14, or 16 rows, and are sweet. The cob is white. Ripens in from 62 to 86 days. Popular around Boston. It is a good canning variety.

Crosby. Stalks 5 to 5½ feet, with ears close to the ground. The ears are 5 to 7 inches long, 10 or 12-rowed, with small, white kernels. The cob also is white. Quality excellent. Good to follow Cory. A favorite on the Boston market, and in general a good market or canning variety.

Delicious (Holmes). This corn ripens within 10 or 11 weeks from planting and is highly recommended. Ears small, 10 to 12 rows of kernels.

Epicure. Same as *Honey Sweet.* The ears are large, and the quality and flavor good. 12 rows of kernels.

Everbearing. Stalk 6 feet high, stout, and a healthy grower. Stalks and husks have a red color. The ears are short and small, 6 inches long, with 12 rows. The ear does not fill well and there are spaces between the rows. Flavor is fair.

Evergreen Early. Stalk 7 feet in height, vigorous and healthy. Ears are $7\frac{1}{2}$ inches long, with 12 rows of small, sweet grains. The variety resembles Stowell's, but is earlier. Shoe-peg type. A good bearer. In demand for home and market.

Golden Bantam. (Described before.)

Golden Cream. Stalks 4 to 5 feet, brownish-red, with healthy, rapid growth. A new early variety, originating in California. It is a cross between Country Gentleman and Golden Bantam, having the character of the first and the color of the second. The ears have the size of the second, being about 5 inches long. The grains are long and pointed, of a rich cream color, turning to light golden-yellow on cooking. They are sweet and tender. The cob is slender.

Golden Dawn. Stalks 5½ feet high. An early yellow-grained variety, having eight to 12 rows. Ripens with Early Crosby. The kernels are very sweet. Prolific.

Golden Honey. Stalk 6 feet tall. Ears of good size, larger than Golden Bantam. Later than Golden Sweet, requiring 75 to 80 days. Quite prolific. Ears are 10 to 12-rowed.

Golden Rod. Stalk grows about 7 feet. Ears 10, 12 and 14-rowed, and 6 to 8 inches long. An improvement on the Golden Bantam. Matures in 100 days.

Granite State. Stalk 5 feet tall. Ears are large and set well down on the stalk. The kernels are medium, white, good, sweet, filling the cob to the end. Matures after Crosby. A good home use variety.

Harvest Early. The ears are large, and the corn very sweet. A 70-day corn, grows 7½ feet tall. Ears 7 to 8 inches, with 12 rows of kernels.

Henderson. Stalk 6½ to 8 feet tall, maturing the ears in 90 to 100 days. White grain and cob. Kernels sweet and tender,

in 10 to 16 rows on large, thick ears, 7 to 12 inches long. The plants are prolific. A canning and market variety.

Honey Sweet. Stalk $5\frac{1}{2}$ to $7\frac{1}{2}$ feet high, of a deep red color, as are also the husks. Ears 6 to 8 inches long, 10 or 12-rowed. Grains are deep and creamy-white. Cob is white and small. Quality good. Matures in 85 or 90 days.

Howling Mob. Stalks $4\frac{1}{2}$ to 5 feet tall, with abundant foliage. Ears are 7 to 9 inches long, with 12 or 14 rows of pearly-white grains. The husk is heavy, extending out over tip, thereby protecting from worms. This variety originated in Toledo, the name coming from the demand.

Early Howling Mob. Five days or more later than Cory. It is an improvement on Howling Mob, but similar.

Mammoth Early. Also known as *Marblehead Mammoth*, etc. Stalk 6 to 9 feet in height. The ears are of large size, from 8 to 10 inches, tapering toward the point. There are 12 to 16 rows of large, white kernels, which are sweet and shaped

similarly to Crosby, but larger. The cob is white. The husk is thick, and the plant withstands early frost, making an excellent variety to plant July 1 for the late crop. Ripens in 96 to 101 days.

Maule's XX. Stalk 5 to 6 feet tall. Ears from 9 to 12 inches, and 12 to 16-rowed. The kernels are sugary, and remain in an edible condition for a long time. Ripens in nine to 10 weeks from planting. A prolific variety.

Moore's Early Concord. Often called *Moore's Early* or *Moore's Concord.* Stalks varying from $4\frac{1}{2}$ to $7\frac{1}{2}$ feet in height. Ears are 6 to 8 inches in length and contain from 12 to 16 rows. They are white and are produced low on the stalk. This variety is a large yielder and a good keeper, and is of a good quality. It comes in after Perry's Hybrid, ripening in from 85 to 90 days.

Nonesuch. Also called *Clark Nonesuch,* and *Clark Early Nonesuch.* Stalk 6 to $6\frac{1}{2}$ feet high, with ears 9 to 12 inches in length. The grains are in 12 rows, filling the ear

to the tip. Kernels large, tender and sweet. They are white, but the cobs are pink. Matures in 80 to 85 days.

Perfection Early White. Stalk 7 feet high and medium stout. A good grower and good producer. Cob is small, but ear good sized, with large, flat, short, white grains. The ear is badly filled, irregular, and rough. Kernels are in eight or 10 rows. Flavor fair to sweet. A perfect type with no flint or glaze.

Perry's Hybrid. Stalks 4 to 6½ feet tall, strong growing. Ears are 6 to 8 inches long, well filled, with from eight to 14 rows of grains. Kernels are white, and cob pink or white. Matures in from 64 to 78 days. A popular eastern variety.

Potter's Excelsior or *Squantum.* Other names are *Large Excelsior*, *Excelsior*, and *Roslyn Hybrid.* Stalk 5½ to 8 feet high. Ears 6 to 7½ inches long, well filled, 12 or 14 rows of deep, white kernels. A sweet, tender variety, with white cob. Originated on Potter Farm, Rhode Island. Matures in 95 days. A favorite with market gardeners.

Premier. A large, medium early variety of good quality. Matures in 65 days.

Quincy Market. Stalk 7 feet tall. Ears 12-rowed, 7 inches long. Larger than Crosby, but resembles the latter. Ears are large and well filled. Kernels sweet and tender, in 12 rows. Highly recommended. Good for home and market.

Seymour's Sweet Orange. Stalk 6 to 7 feet high. Ears are 6 to 7 inches long, with 12 or 14 rows. Grains slender, light yellow. Husk strong and heavy. Hardy. The variety is a week later than Golden Bantam, and equals the latter in quality and flavor.

Shaker, Early, Early Stabler, or *Extra Early Stabler.* Stalk 5 to 7 feet high. Cob and grains are white. Ears 6 to 7½ inches long with 10 to 14 rows of broad, tender grains. Flavor is good. Matures in from 66 to 100 days, with an average of 80. Good for the home garden.

Sheffield. A cross of *Extra Early Adams* and *Cory.* It combines the robust growth and hardiness of Adams with the quality of Cory. Ears are 6 inches long. Grains of medium size, in 10 or 12 rows; sweet.

LATE VARIETIES

Banana. Stalk of medium size. Ears 5 to 6½ inches long, 16 to 20-rowed. Kernels are separate, irregular, loose and white, and cob is white.

Bearsfoot or *Washington.* A large, good grower. A favorite with Boston market growers.

Black Mexican. (Description given before.)

Broad Grained (Livingston's). Stalk 7½ to 8 feet. A special, selected strain. Grain very broad and deep. Eight-rowed. Ears 7½ to 8 inches long.

Country Gentleman or *Egyptian.* Stalk and ears of medium size. Grains deep, in irregular rows, white, sweet and tender. Ears 6 to 8 inches long, 1¾ inches in diameter, 12 to 18-rowed. Cob small, white. A variety for choice trade. A cross between Ne Plus Ultra and Stowell's Evergreen.

Evergreen Livingston. This is an improved Stowell's Evergreen.

Evergreen, Livingston Red Cob. Stalk 8 to 12 feet high. Ears 7½ inches long, with

20 rows. Grains white and cob red. Ears are large and well filled; cob small; kernels broad. Maturity reached in 102 days.

Evergreen Livingston White Cob. Same as Livingston Red Cob Evergreen, except in having a white cob.

Evergreen Private Stock. Same as Improved.

Evergreen, Stowell's. Plant 6 to 8 feet high in New York, 5 to 7 feet in Canada, and 10 to 12 feet in some cases on rich soil. Ears are 7 to $9\frac{1}{2}$ inches in length, $2\frac{1}{4}$ inches in diameter, 12 to 20-rowed. Grains white, deep set. A productive, tender, sugary variety, remaining good a long time. A standard late variety. Requires 69 to 87 days to ripen in Illinois, 93 to 98 days in New York, 90 or more days in Michigan. Desirable for market, home and canning.

Evergreen White. Stalk 7 feet tall. Grains very white, even when canned. Tassels are white, and silk light colored. The deep grains are in 16 or more rows. Husk thick. Ripens 5 days earlier than Stowell's. Good for market and canning.

Evergreen Zigzag. Stalk large, growing to a height of 10 to 12 feet. Ears 7 to 8 inches in length, and $2\frac{1}{4}$ inches in diameter. Grains similar to Stowell's, but arranged in the way which gave rise to its name. Cob is white; grains white, 16 to 20-rowed. Quality good. Eight days earlier than Stowell's.

(Improved) Giant Sugar. Same as Hickox Improved. Stalks short, thick, strong, withstanding wind and rain. Ears are 12 inches long, thick, with sweet, deep kernels. Origin in the Northwest. A market variety.

Hickox Improved or *Mammoth Sugar.* Stalk varies in height from $5\frac{1}{2}$ to 8 feet. Ear 6 to 10 inches long and 2 inches in diameter, 12 to 14 rows. Dull white kernels; white cob. Fine quality. Matures in 96 days, making the variety seven to 14 days earlier than Stowell's. A good canning and drying variety.

Little Gem, Ne Plus Ultra, or *Shoe-Peg White.* Stalks 6 to 7 feet tall. Ears $5\frac{1}{2}$ to $6\frac{1}{4}$ inches long, 14 to 24-rowed, irregular. Sweet and tender. Similar to Country Gentleman. Matures in 74 to 98 days.

Mammoth Late. Stalk 7 to 9 feet high. Ears $8\frac{1}{2}$ to 11 inches long, 12 to 18-rowed. Cob white; kernels sweet and tender. Later than Stowell's, and keeps in good condition a long time. Ripens in 76 to 97 days. Good for home and canning.

PART III

CHAPTER XXIV
HISTORY AND IMPORTANCE OF CANNING

SWEET corn has become one of the most important articles that is placed in cans in the United States. It is impossible to estimate the number of acres devoted to sweet corn grown for canneries, or the number of farms used for the same purpose. This point was undoubtedly included under the question of sweet corn grown for commercial purposes. However, it is possible to give some idea of the importance of canned corn from the number of cases of corn which are put up each year.

According to the census of 1910, the number of cases of corn in the United States was 13,109,000. The seven leading states in this industry are Iowa, about 3,000,000 cases; Illinois, 2,438,000; Maryland, 1,517,000; Ohio, 1,376,000; Indiana, 1,235,000; Maine, 801,000; Wisconsin,

519,000. It is easily seen from these figures that the mid-West is the most important canning section in the United States, as in the first 11 states there are five that are included from that section. However, it is generally conceded that sweet corn packed in Maine seems to lead all other states, as we have in these western states a corn known as Maine Style. This is, of course, imitation of something from another state.

HISTORY OF CANNING

* "Canned corn is the result of the persistence of Isaac Winslow, of Maine. He was a sailor by occupation, and in his wanderings upon the high seas visited France and learned of the method of preserving food by canning. The advantage of such foods, particularly to sailors, was obvious. Mr. Winslow began experimenting on the canning of corn in 1839, the first trials consisting in boiling the corn on the kitchen stove for varying periods

* From United States Bureau of Chemistry

of time. The cans were marked and a record kept of each lot. The results were mostly failures, but a sufficient number of cans were saved, and these were of such good quality that the efforts were continued. The succeeding years gave essentially the same result. In 1843 he built a small boiler to generate steam and a wooden box in which to put the cans, so that the cooking might be done in a closed steam chamber. As the results were less successful than in the previous years, the steam box was discarded. It was not until 1843 that he had sufficient success to warrant applying for a patent on his method, and it was regarded with so much distrust that the letters were not granted until 1862.

"Winslow first packed the corn on the cob, but this was bulky, and he believed that the cob absorbed some of the sweetness. He next pulled the kernels off the cob with a fork, and finally cut the corn with a case knife. Winslow's apparatus and methods were crude, but he discovered the principles which underlie the canning of corn. It

may also be said that he and his successors brought fame to Maine corn as a canned product, and this reputation persists to the present time."

CHAPTER XXV
METHODS OF CANNING CORN

"THE canning of corn is a large industry in Maine and other states, extending from New York to Maryland, west to Iowa, and north to Minnesota. In most of the eastern states the crop is grown by numerous farmers in small patches of a few acres, while several of the western factories raise their own corn, covering hundreds of acres. At Hoopeston, Ill., two canneries use the produce of 7,500 acres.

"Claims are made that certain sections produce better and sweeter corn than others. This is not always sustained by facts, for quality is also affected by the variety and state of maturity when gathered. Again, some canners pay more attention to the quantity of corn grown on an acre than to the quality. The seed used is grown by specialists, as a rule, and a very large part of it comes from Connecticut, a state in which no canning of corn is done. The type of corn used now is quite different

from that canned several years ago. The effort is to develop a tender, fine-flavored sweet corn. The ears are of two types, those having large, flat kernels arranged in rows and those with small, long kernels irregularly placed. Stowell's Evergreen is typical of the former type and Country Gentleman of the latter.

"A modern corn-canning plant is a large establishment, equipped with valuable automatic machinery to do the work in a rapid, cleanly manner. When the corn arrives at the factory, it is dumped from the wagon upon a conveyer, which carries the ears to different parts of the husking shed as they are needed. Most of the husking is done by hand, but this will undoubtedly give way to machine methods, as husking machines have been almost perfected in the past year. As rapidly as a bushel measure is husked, it is put upon a conveyer, and while on the way to the silking machine is sorted for quality.

"A high grade can be secured only by selecting ears with grains which are uniformly

tender. Corn which is too old or too young to make a fancy grade of goods is taken out and held until a sufficient quantity accumulates to make a run on a lower grade. The silking is done by means of rapidly revolving rolls and brushes. As the ear revolves on its axis and at the same time is carried forward, it is gently wiped by rapidly revolving brushes, which pick up any silk that may be attached. This work is done with remarkable rapidity and by machinery so carefully adjusted for any irregularity in the size of the ears or even in the same ear that there is no chafing or bruising of the tenderest grains. The process is immediately followed at some factories by a thorough spraying with water, while at others it is omitted, the claim being made that a certain flavor is lost.

"The corn is cut by machinery, and from the time the ear is fed into the cutter until the corn is sealed in the can it is not again touched by hand. The ear is forced through a series of curved knives, mounted in an adjustable circular frame, so that they will

accommodate themselves to the varying size of the cob. Scrapers complete the work by removing the grain and soft bits of kernel at the base. The corn again passes through a machine to remove bits of silk, husk or cob, so that the final product is as clean as labor can make it. The cleaner consists of a series of wire combs, which intermesh as the corn passes through, and wire cylinders which act as sifters.

"The corn is next mixed and cooked, and in this operation it is necessary to add some water, otherwise it would become a dry, tough mass in the can. The quantity of water used will depend upon the consistency desired and the condition of the corn. Some varieties require more than others, but the average quantity used in cream corn is about five ounces to the can. It is also usual to add both salt and sugar to the corn to give the desired flavor. These are used in all grades, though more carefully in the high grades than in the low. The eastern packers, as a rule, use more sugar than the western.

Courtesy Tribune Farmer. UNLOADING SWEET CORN AT THE CANNING FACTORY

"The care with which the cooking is done before the corn enters the can determines, in a large measure, its appearance. The addition of too much brine will give a sloppy can, while the use of too little gives a dry can. Insufficient cooking will leave the brine and corn separated; the quantity of brine may be right but the corn may be dry in the bottom of the can and most of the brine on top, or they may be mixed but not blended. The preliminary heating is done by steam, using automatic machinery, which heats and evenly mixes the corn and brine and at the same time fills the cans. The corn enters the cans at about 180 degrees and the capping is done in the usual manner.

"Corn is one of the most difficult products to process. It requires a temperature of about 250 degrees for 75 minutes to insure sterilization. There are packers who process at from 240 degrees to 245 degrees for 90 minutes, and others who process their corn twice to insure keeping. The higher the temperature the browner the corn and

the more pronounced the cooked taste. The consistency of the corn makes a great difference in the heat which must be given; the drier the corn the slower the heat penetration.

"Corn is packed as 'cream corn,' or as it is sometimes called, 'Maine style,' the kernels being cut as already described and the portion scraped from the cob added. The product should be of a thick, creamy consistency. Again, the corn is cut from the cob as closely as possible by knives, but only the whole grains are used, the bits and scrapings being discarded; corn used in this way must have long, slender grains, commonly called 'shoe peg,' and the quantity of brine be such as to keep the kernels separate. This method of preparation is called 'Maryland style' by the trade.

"In some instances the corn is run through a re-cutter, which gives a grainy effect or one like the cream corn, depending upon the method of handling. This procedure is also followed in working up corn which has become too old to make a good regular

pack. Corn may be run through slitting machines, which cut the grains open on the end and then squeeze out the contents, leaving it free from hull. Cut corn is also run through a 'cyclone,' a machine for forcing the creamy portion of the kernel through a fine sieve, thus removing all of the hull and giving much the appearance of green corn meal.

"Field corn is not used in canning. Some of the sweet corn used produces very large ears and coarse grains, which give rise to the suspicion that field corn has been substituted. There has been a very general improvement in sweet corn in the past 10 years, and it will probably not be long before the coarser variety will give way to a better and sweeter one.

"A can of fancy corn upon opening should be well filled (within three-eighths of an inch of the top), should be absolutely young and tender stock, medium moist, practically free from silk or bits of cob or husk, only slightly darker than natural or of a light golden-brown color, and have the distinctive

HUSKING CORN FOR CANNING. (Peck and Pratt Co., Hilton, N. Y.)

Courtesy Tribune Farmer.

young corn flavor. The weight of the contents should be about 21 ounces. If put up in 'Maryland style,' the kernels should be separate and the brine nearly clear and the corn should weigh not less than 13.5 ounces, exclusive of the liquor.

"A can of standard corn should be well filled, reasonably tender, fairly bright color or slightly brown, and nearly free from silk, bits of cob or husk. The flavor should be characteristic of young sweet corn. If put up in 'Maryland style,' a part of the kernels may be somewhat hardened and the brine a little cloudy." *

Lately there has been some advancement in the canning of corn at home, and there are a great many outfits on the market which are useful for this purpose. The steam pressure canning outfit ranges in price from $10 up, according to the style desired. It is possible, some people have found out, to invest $75 or $100 in one of these canning outfits, and thereby increase the returns from the corn in this way.

* From United States Bureau of Chemistry.

There is, of course, in many homes the process of canning corn in glass jars under the old system, and there is another process, which is that of drying corn. This last process is very little known in some sections. In the latter way, the corn is generally cut out from the cob and dried either by fire heat or, as the older people used to do, by the sun's heat. The corn, when fully dried, was then placed in jars or some receptacle where it was retained in that condition. When wanted for use, it was soaked in water, later milk, butter and other ingredients being added.

Corn on the ear is sometimes canned in salt brine, the brine being of a saturated mixture. It is quite difficult to soak out the briny taste, and therefore the method has not met with great approval.

The general tendency in canning is to specialize in the commercial side, and it is of interest to know just exactly what is required of farmers who are growing corn as a business for canning. The following are contracts which are taken from the East and the West:

READ YOUR CONTRACT

AGREEMENT made at....., N. Y.,.....1913,

by and between.....

P. O. Address.....

first party, and.....CANNING CO., second party.

First party agrees, subject to all the terms and conditions named on the back of this sheet, which are hereby referred to and made a part of this agreement, to plant or sow, harvest and deliver each variety of different kinds of vegetables separate to second party, AT ITS FACTORY AT.....N. Y., during its 1913 canning season:

.....acres Early Evergreen Sweet Corn

.....acres Country Gentleman Sweet Corn

.....acres Hickox Sweet Corn

.....

.....

Second party agrees to receive same, *subject to all terms and conditions named on back of this sheet*, which are hereby referred to and made a part of this agreement, and pay for same at its factory office,....., N. Y., for

CORN

Early Evergreen, 70 cents a 100 pounds, averaged corn, on January 15, 1914.

Country Gentleman, 75 cents a 100 pounds, averaged corn, on January 15, 1914.

Hickox, 70 cents a 100 pounds, averaged corn, on January 15, 1914.

.....

By.....

No. 349 CANNING CO.

By.....

Ledger No.....

N. Y.

(Found on back of contract)

CONDITIONS

CORN—To be planted carefully, cultivated thoroughly, and kept free from weeds and all foreign growth until ready to harvest; to be picked (short, stubbed ears known as "nubbins" excepted) and to be delivered, each variety separate, during second party's canning season, in the husks and while the kernel is in the milky condition (not allowing it to become creamy), on the same day it is picked, in perfect condition for canning purposes and before foliage has been frosted. It being further agreed that second party may decline to receive more than two tons averaged corn to a contracted acre.

It is agreed that the quantity of corn delivered under this contract shall be determined by the process known as "averaging." That in such process of averaging, all husks, silks, ears without corn, ears of corn with colored kernel or kernels of any kind other than sweet corn, all corn not in the milky condition and short, stubbed ears known as "nubbins," shall be thrown out, and tips and butts of ears having no corn on them shall be removed.

Care should be taken not to mix different varieties of seed. Plant each kind separate. Arrange, if possible, to have at least 10 or 15 rods between sweet and field corn, if growing the latter.

WASTE—It is agreed that all corn husks and corn cobs, as well as other waste delivered with products named in this contract, belong to and are the property of the second party. But second party may, at their discretion, during the canning season, allow first party a reasonable amount for immediate feeding.

SEED—For all crops under this contract to be furnished by second party at its factory, at....., N. Y., at the following prices:

Corn, $2.50 a bushel; Bags, 20 cents each.

Second party gives no warranty, expressed or implied, as to quality, variety, or productiveness of seeds furnished, but uses every effort to secure the most reliable grown.

BAGS—Must be returned previous to July 1. To assure credit, receipts should be taken when left at factory.

SETTLEMENT—It is agreed that in settlement for deliveries under this contract, second party is first to deduct any account he may have against first party.

It is agreed that second party shall not be held liable, under this contract, in case factory is destroyed by fire or rendered inoperative from any cause.

This contract is not transferable by first party.

No deliveries to be made on Saturday or Sunday except by permission of second party.

SWEET CORN CONTRACT

.....Iowa,.....191....

In consideration of $9 a ton, net, for Evergreen Sweet Corn, to be paid by the first party on December 1 after this date, the undersigned grower hereby agrees to plant and raise for the.....Canning and Preserving Company .....acres of sweet corn, same to be delivered at its canning factory in....., Ia., as required by said company during the canning season. It is understood that corn is to be snapped short and delivered in the husk, but a fair average sample shall be taken from each load and promptly husked and the net weight of each load determined by said test. Only good sound corn in suitable condition for canning shall be accepted in testing. Said company shall furnish seed at $2 a bushel, price of seed to be deducted from proceeds of corn unless sooner paid.

1st—Grower agrees to make.....separate plantings. The succeeding plantings not to be made until the preceding planting is well up. He also agrees to report to company the number of acres planted at each date.

2d—Grower agrees to deliver only good sound corn in suitable condition for canning and free from smut, cobs without well-formed kernels, dented corn or corn too dry and hard to can properly.

3d—Corn must be delivered the same day it is snapped and must not be allowed to become heated or damaged.

4th—Grower agrees to stop delivery if notified by company that corn is not yet ready or that they cannot properly receive it. He also agrees to put on extra help if notified that corn is in danger of becoming too old and dry.

5th—It is understood and agreed that there shall be mutual co-operation in delivering and receiving corn so as to best

accommodate and profit the grower and give the company corn best adapted to making a high-grade article.

6th—Company reserves the right to reject any corn overheated, damaged, with dead husks or mixed with field corn.

7th—No corn shall be delivered after 2 p. m. Saturdays except by consent of company.

8th—This contract to be void should factory be destroyed by fire or other cause beyond control of company.

.....Canning & Preserving Company.

By.....

Grower.....

It will be noticed that, as a whole, the requirements on these contracts are the same for both sections, and we find that they are very uniform throughout the United States.

CHAPTER XXVI

GROWING OF SWEET CORN FOR CANNING

WHAT IS REQUIRED OF GROWERS

GENERALLY speaking, the grower is required to use the seed sent out by the canneries, to plant this seed in such a manner that it will produce large crops of corn. It should not only be planted, but should be looked after and cared for in the correct manner, so that the corn will come in throughout the entire field at the same time. This may be changed, however, where the cannery is small and only a certain number of acres are planted on such a date, another number of acres being planted a little later, and so on.

Generally speaking, the grower is obliged to harvest the corn when the company request him to. The company generally maintains a man in the field who keeps a sharp watch upon the corn when it is approaching harvesting time. He will then inform the grower that it is ready to begin

harvesting, and the grower must comply with his wishes and carry the product wherever the contract denotes, and deliver it in the manner in which the contract states.

SITE

As a general rule, the site for corn growing under canning methods is of about the same importance as mentioned under commercial growing by truck growers. Any good gravelly or sandy soil will produce good corn. As the major part of the corn is late, the question of slope is not so important as with the early varieties of corn. Generally speaking, the man places this corn in rotation with other crops and does not look very closely into the possible location or the soil for this crop. In the rotation, sweet corn generally follows grass, and is in turn followed by potatoes and perhaps by a small grain, and then by grass again.

MANURING

Stable manure is used in some places where available. However, the supply is generally limited, and perhaps only 10 tons

an acre or even less are used, and therefore it is necessary to use some artificial fertilizers with the crop, from 300 to 500 pounds of a low-grade fertilizer generally being the one used, fertilizer analyzing 2-7-6 being applied when the seed is dropped with the planter. Sometimes in the place of stable manure, green crops are used, such as clover, rye and so forth. These are plowed down, and then the fertilizer used when the crop is planted. This is a very good method.

PLOWING

As the corn crop for canning cannot be planted until all danger of frost is past, and as it would therefore fall into the list of the late plantings, the plowing might be carried on later than with the other crops. Generally, about May 1 the plowing should be begun, followed a little later by harrowing. The plowing and harrowing should be very thorough. The methods spoken of under commercial growing should be used here, so that a good seed bed may be given for the growing of this crop.

MARKING

As soon as plowing and harrowing have been finished and the field is in condition to plant, marking should begin, especially if the rows are required to be straight. This marking could be done with a four-row marker, such as a common scantling with pegs or cleats on the same, drawn by horse power; or it may be marked with a two-row, two-horse disk marker. However, where some types of corn planters are used, the marking is not needed to any extent. Perhaps it may be advisable to mark the first row or two. Following this, the planting is carried on without marking other than that made with the marker of the machine.

PLANTING

Very seldom in recent years does the grower of corn for the cannery use the hand in planting corn. He finds it more to his advantage to use one of the machines in planting, as the work can be done a great deal quicker, thereby saving much of the man's time. The planter is set to drop

a certain number of seeds, perhaps four to six, and at the same time to drop a limited amount of fertilizer.

However, if the field is to be check-rowed and cross-cultivated, it may be to the advantage of the man to give a little more care to the operation of planting his corn. It is practically next to impossible to do thorough, good work, so that the field is check-rowed, with a single-row corn planter. However, with most varieties of two-row planters it is possible to plant in checks, and therefore cultivation is easier.

CULTIVATION

Cultivation should begin as soon as the seed is planted and the ground should be thoroughly stirred throughout the growing season. The first tool to be used is the weeder, which should be used every few days until the corn is 3 to 4 inches tall, generally, four or five weedings being sufficient. First, weed the way the rows run, and then across. After the corn is through the ground, weed only the way the rows

run. Following the weeder, work should be given with the fine tooth cultivator, such as the 11 or 12-point, and the cultivation should be kept up, so that competition between the weeds and the plants will be avoided and a soil mulch may be given, so that conservation of the moisture will be constant. If this is practiced, then the resultant corn is quite satisfactory. Some men prefer to use the larger-tooth cultivators, but the corn is a shallow-rooted crop, and great injury is done when these tools are used, unless they are used at first not too deep close to the plant, and toward the end of the season gradually decreasing the depth. From the author's experience, he finds the shallow tooth cultivator preferable. It does not seem possible to cultivate corn too much.

SUCKERING

Suckering the corn for the cannery is just as important as suckering the corn for commercial growing, and should be carried out as thoroughly as for commercial growing. It is by suckering that the best

corn is produced and the largest amount of corn is produced to the acre.

HARVESTING

Harvesting must take place when ordered by the company. The inspector of the company will pass from place to place, and as he finds that the corn is mature enough for the cannery, he will direct that the harvesting begin. The harvesting will generally take place in the morning, and drawing to the factory in the afternoon. In the harvesting, the corn is removed from the plant in the same manner as spoken of under the other systems. The corn is immediately placed in the wagon. It may, however, be placed first in a basket, and then dumped into the wagon. When the wagon is full, it is then time to take it to the cannery.

MARKETING

The marketing of corn for the cannery is very simple. It requires nothing more than to be drawn to the cannery, where

the wagon and the corn are weighed. The corn is then taken out of the wagon and placed on the cannery platform, and the wagon is then re-weighed, the difference being the weight of the corn, the corn being paid for on the basis of weight of ears. If the corn is paid for upon the basis of actual corn, then one must depend upon the canner to pay the right amount. In loading and unloading, care must be exercised that injury is not given to the ears. They should be full, plump and choice, and free from injury for canning.

GROSS RECEIPTS

It has been found by observing the returns on canning from the various sections of the country that the average price of corn in the East is about $10 a ton for corn, cob and husk. In the West, in some places it is as low as $8.50, and for certain varieties it is as high as $12.50 a ton. The average, however, would be about $9 a ton throughout the United States. The highest prices paid would be around $12.50 to $14, and the lowest prices $7 to $7.50.

The returns for an acre gross average anywhere from three to six or in rare cases eight tons. Sometimes a larger amount is obtainable, and sometimes only the smaller one is possible.

NET RECEIPTS

Net receipts from different varieties of corn in the several sections vary. Sometimes we find by actual figures that the cost of production is about equal to the gross returns—therefore, there is not any net. In other sections there is $10 to $15 profit up to $50 an acre on corn. It is found that with Stowell's Evergreen, although the price received is less than for the Country Gentleman, the amount of corn raised is larger than Country Gentleman, and therefore the net receipts are generally larger. The Country Gentleman, however, is preferred by a great many canners, and a higher price is paid for the product.

CHAPTER XXVII

UTILIZATION OF THE BY-PRODUCT

FODDER

WHEN the question is raised that very little profit is obtained from raising corn for the canneries, the canneries answer that the fodder is of much value to the grower, because he can use it for a great many purposes, and therefore, it helps with the profit. Also the canner is willing to return husk and cob to the grower. The corn fodder may be used for silage, and by some growers is considered of great value in this way. It may be dried and used in the place of hay during the winter as feed to cows. It may be dried and shredded.

The Delaware station gave a comparison of the value of field corn fodder and sweet corn fodder:

SUGAR CORN FODDER

"a. Yields and valuation to the acre.

"b. Comparison with field corn fodder.

"A corn cannery at Newark, Del., has directed the attention of dairymen to the feeding value of sugar corn fodder. As it apparently opens up a field of temporary advantages at least, the following details have been noted:

"A heavy corn crop in 1891 left a 25-acre field well set in crimson clover. The field was top dressed early in the spring with acid phosphate, and just at the time that this clover was coming into blossom 25 cows, six or eight brood mares and colts and 50 ewes with their lambs were turned into it. They pastured there for nearly five weeks. Then the field was plowed and again fertilized with 200 pounds an acre of a complete fertilizer. Stowell's Evergreen variety of sweet corn was planted on the following dates: Nine acres on June 15, eight acres on June 20, and eight acres on June 23.

"The cannery records of the yields of ears from this field are as follows:

September 7..	17,254 lbs.	September 20..	28,804 lbs.
September 8..	10,569 lbs.	September 21..	25,349 lbs.
September 13..	11,255 lbs.	September 22..	4,432 lbs.
September 14..	4,300 lbs.	September 23..	6,803 lbs.
September 16..	10,555 lbs.	September 24..	2,255 lbs.
September 19..	17,122 lbs.		

Sum total....138,698 lbs.
69 tons, 698 lbs.

"On November 1, $658.82 in cash was received for this product—an average of $26.34 an acre.

"The fodder from 21.7 acres was packed into a silo, each load being weighed by an official of this station. The record reads:

September 28..	15,046 lbs.	October 2....	2,930 lbs.
September 29..	22,707 lbs.	October 4..	18,970 lbs.
September 30..	26,773 lbs.	October 5..	14,659 lbs.
October 1..	22,079 lbs.		

123,164 lbs.

Average yield an acre.....	5,675 lbs.
Percentage of moisture.....	75.5
Average yield of dry matter an acre.....	1,390 lbs.

"The silo was opened on December 16; considerable decayed matter was removed—an estimate places the loss at 10%. The undecayed portion was soon reached and was eagerly eaten by milch cows at the rate of 40 pounds a day to the head. Six pounds of corn meal, four pounds of bran and from one to ten pounds of cottonseed

meal made up the ration. Hay was fed once only every second day; on this basis, the product from one acre furnished six days' fodder for 25 cows.

"The expense of storing 61 tons of this fodder could have been reduced possibly, for on the average 10 tons daily were handled by four men and two boys at the cutter and silo, with two laborers in the field and one driver. Of this outlay the field hands, the driver and one stacker would have been required in the ordinary work of fodder curing. The silage, therefore, entailed an additional expense of an engineer, two men and two boys; $46 for 61 tons, or approximately 75 cents a ton.

"It has been stated that each cow consumed 40 pounds of silage. This contains 0.84 pounds protein, 8.70 pounds carbohydrates and fiber and 0.16 pounds oil.

"To replace this, 12 pounds at least of timothy hay would have been necessary. Roughly calculated, therefore, 61 tons of this silage equal $18\frac{3}{4}$ tons of timothy hay. The farmer could have sold the hay which

After the ears are sold the corn can be cut, stacked and dried, later being used for feeding cows or other animals.
Courtesy Cornell University.

he would have been obliged to feed to his stock under the ordinary method of farming for $16 a ton. His silage, therefore, adds $293 to his farm income in the shape of hay sales; it adds $46 to his expenses in the shape of wages, and leaves him a balance in his favor of $247.

"Before these results can be brought into permanent records, the number of days' feeding must be determined; this silage under present conditions should last until the middle of April, 1893. The outlook now is for unusually heavy milk yields during this interval, which may increase the cash balance materially.

SUGAR CORN VS. ORDINARY FIELD CORN

"The land upon which the sugar corn grew was in field corn in 1891. It yielded 68 bushels shelled corn and 6,000 pounds fodder to the acre, or roughly, 88 pounds fodder to one bushel of corn. The owner believes that had he plowed his crimson clover under on May 10 and seeded his ground a second time in field corn, his

crop would have been at least 60 bushels of grain and 5,000 pounds of stalks to the acre; for the adjoining field yielded this season 70 bushels of grain to the acre.

"Sixty bushels of corn at 45 cents a bushel equals $27 an acre, a trifle more than the sugar corn produced. At husking time the field corn fodder in 1892 contained 33% of water; hence the following comparisons can be drawn:

Nutrient	Sugar Corn Fodder 1,390 lbs. dry matter per acre	Field Corn Fodder 3,300 lbs. dry matter per acre
Protein.....	110 pounds	212 pounds
Fat.....	14 pounds	62 pounds
Fiber and Carbohydrates.....	1,186 pounds	2,816 pounds

"That is, while 60 bushels of field corn an acre at 45 cents a bushel equals 5,548 pounds of sugar corn ears at $9.50 a ton, the fodder differences are considerable, the field corn producing twice as much protein, $2\frac{1}{2}$ times as much carbohydrates and fiber and four times as much oil to the acre as the sugar corn.

"Farmers who substitute sugar corn for oats, and attempt to cure its fodder and

to feed it in the yard in the ordinary manner, will do well to weigh the above comparison. Those who use the silo will prefer its sugar corn to that taken from the field corn stacks. Those who shred their field corn stalks and feed them without waste will be obliged to seek their profits in sweet corn culture, either in the conveniences which it affords in fully utilizing necessary labor engaged by the month or by the year, or as this farmer does in the five weeks of crimson clover pasture preceding corn planting. This was worth to him last season $119, on an allowance of 50 cents a week for horses and cows and 7 cents a week for ewes and lambs."

CHAPTER XXVIII
SEED GROWING AND VARIETIES

SEED GROWING

AS a general rule, the canneries look after the seed which is used by the growers. Some of the largest factories grow their own seed and distribute it among the growers. Other factories hold contracts with seed firms for the growing of the seed. It is found that the state which produces the most seed for canning is Connecticut. A large amount is also produced in Massachusetts; one firm raises over 400 bushels annually for canneries in Maine. It is sold as well to the seedsmen throughout the United States, besides being used for distribution among the growers. This seems to be a specialized industry, and requires some attention in order to produce the corn which is required for canning.

A typical ear is one which is of medium size, well filled from the butt to the tip, of even kernels, of large enough size so

that they can be readily severed from the cob. Some of the canneries have a special corn which is not named which has been produced for them by the seed growers or is grown by themselves, and is the result of selection through many years.

VARIETIES

As a general thing, the varieties of sweet corn are limited to but few of those mentioned under commercial gardening. Stowell's Evergreen seems to lead the list for the one most generally planted. Country Gentleman, however, is one that is desired by many canneries, but owing to its low yield is not so generally planted as Stowell's Evergreen. The Climax is a common corn grown in the East. Hickox is another corn that is being used to a great extent, especially in the mid-West. Crosby is grown to some extent in all of these sections.

Taking the varieties as a whole, we find that the one most desired by the canners who put up "Maryland style" is the "shoe-

peg" type, such as Country Gentleman and Zigzag Evergreen. However, owing to its low yield, it is not so commonly grown as some of the others, and therefore we find a second quality variety, such as Stowell's Evergreen and Climax, being used by a great many of the men in the canning business. Maine, and canneries in some of the other states, have a first-class variety developed for canning "Maine style."

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